Blekinge Institute of Technology
Department of Mechanical Engineering

Revision: 1,1
Reg.no: BTH-4.1.14-0193-2022

COURSE SYLLABUS

Transformativ produkt- och tjänstesystemsinnovation

Transformative Product-Service System Innovation

15 credits (15 högskolepoäng)

Course code: MT2573
Main field of study: Mechanical Engineering
Disciplinary domain: Technology
Education level: Second cycle
Specialization: A1F - Second cycle, has second cycle course/s as entry requirements

Language of instruction: English
Applies from: 2022-08-29
Approved: 2022-02-03

1. Decision

This course is established by Dean 2021-01-07. The course syllabus is approved by Head of Department of Mechanical Engineering 2022-02-03 and applies from 2022-08-29.

2. Entry requirements

Admission to the course requires 180 passed credits, of which 80 credits is from an MSc Engineering Program in Mechanical Engineering, Industrial Management and Engineering, or equivalent, including completed course product development methodology (Design Thinking 7,5 credits, Systems Engineering 7,5 credits Value Innovation 7,5 credits or equivalent).

3. Objective and content

3.1 Objective

The objective of the course is for students to gain an understanding of how different solutions are developed in the industry today by applying and integrating knowledge needed for future product and service system innovations (PSS innovation). Students gain proficiency in project management, creative concept development, systems thinking for sustainability, and technical solutions.
The course focuses on implementing product/service development with sustainability and innovation in focus. The purpose of the course is for students to acquire, apply and integrate the core of knowledge to develop sustainable PSS solutions, in close collaboration with the business community. By carrying out reality-based projects, the student gets the chance to apply the acquired theoretical foundation in a real environment and reflect on it. The experiences give the students good qualifications to enter working life.

3.2 Content

Application of:
- Team collaboration, including leadership
- Innovation engineering
- Needfinding
- Retrieval of benchmarking information
- Creative concept generation and concept evaluation
- Systems design
- Simulation-driven design
- Prototyping
- Solution validation and testing
- Business models for innovation

4. Learning outcomes

The following learning outcomes are examined in the course:

4.1 Knowledge and understanding

On completion of the course, the student will be able to:
- describe and analyse how products and product-service-system (PSS) solutions are developed

4.2 Competence and skills

On completion of the course, the student will be able to:

- conduct Needfinding
- acquire and integrate theory and practice, taking into account the application area's conditions
- develop and analyse conceptual solutions
- develop and analyse prototypes
- develop and analyse innovative product-/service-system (PSS) solutions
- use simulation-driven design tools in applied situations
- develop a visual business model as complement to a product- or product-service-system (PSS)-solution
- verbally and in writing describe and reflect on their findings and conclusions - in dialogue with other students

4.3 Judgement and approach

On completion of the course, the student will be able to:

- analyse, reflect on, and argue for the benefits of the result, with regard to customer desirability, technical feasibility, and commercial viability.
- analyse and explain the project results in terms of (environmental, social, and economic) sustainable development.
- critically analyse, reflect on, and discuss their own - and others' - approaches, insights, and conclusions

5. Learning activities

The course focus is to give the participant knowledge to carry out and implement real product-service development with a focus on sustainability and innovation. Through reflection, workshops, group exercises, and project work, the student gains an understanding of PSS Innovation. The participants work in groups, from needs identification to finished product, in close collaboration with industry partners, to gain an understanding and experience of today's and tomorrow's ways of working in integrated product development projects. Students will complete the tasks at a group level and share their learning through written reports, group work, and presentations.

6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
2110	Written report 1	1.5 credits	AF
2120	Written report 2	3.5 credits	AF
2130	Written assignment 1	1.5 credits	AF
2140	Written assignment 2	3.5 credits	AF
2150	Practical moment	5 credits	GU

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.

The information before a course occasion states the assessment criteria and make explicit in which modes of examination that the learning outcomes are assessed.

An examiner can, after consulting the Disability Advisor at BTH, decide on a customized examination form for a student with a long-term disability to be provided with an examination equivalent to one given to a student who is not disabled.

7. Course evaluation
The course evaluation should be carried out in line with BTH:s course evaluation template and process.

8. Restrictions regarding degree
The course can form part of a degree but not together with another course the content of which completely or partly corresponds with the contents of this course.

9. Course literature and other materials of instruction
Main course literature:
Lewrick, M., Link, P. & Leifer, L. (2018). Design Thinking Playbook. ISBN: 9781119467489, latest edition.
Ulrich, K.T. & Eppinger, S.D. (2011) Product Design and Development, 7th ed. ISBN: 9781260566437 (eller senare upplaga), alternativt Ulrich, K.T. & Eppinger, S.D. (2014) Produktutveckling: Konstruktion och design. ISBN: 9789144074214.
Lewrick, M; Link, P.; Leifer, L. The Design Thinking Toolbox. 2020. Wiley, ISBN 978-1-119-62919-1.
Reference literature:
Eklund, S. (2011) Arbeta i projekt: individen, gruppen, ledaren. ISBN: 9789144072753, latest edition.
Kelley, T. (2016) The Art of Innovation. Profile Books. ISBN: 9781781256145, latest edition.
Ries, E. (2011) The Lean Startup. New York, NY, USA. Crown Business. ISBN: 9781524762407, latest edition.
Articles and cases handed out by the teachers.

10. Additional information
This course replaces the course MT2556