



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Produktinnovation **Product Innovation**

MMKN35, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED M

Date of Decision: 2023-04-11

General Information

Elective for: BME4-bdr, I4, M4-pu, MD5, N4

Language of instruction: The course will be given in English on demand

Aim

The course aims at introducing fundamental knowledge and understanding about strategies, terminology and methodology associated with product innovation and its main sub-processes, the product renewal and the product development processes. The primary focus is set on the strategic parts of the development process, i.e. product renewal including the establishment of the product renewal programme (product plan including a listing of product proposals to be developed by the company). The product development process is further examined in a deeper perspective than was the case in the undergraduate development and design courses, namely, Product Development and Design Methodology, Design Methodology and Biomedical Design. Especially, methods for sustainable product development are presented, and a number of established methods utilized in the product development process are scrutinized and critically reflected upon with reference to the latest research findings. Also the later phases of the product development process, not accounted for in the undergraduate courses, are described and discussed. The students are also expected to have gained such knowledge and understanding that they are able to reflect on and, if necessary, also to suggest improvements to existing product innovation process models.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- have acquired knowledge and understanding about strategies, terminology and methodology of the product innovation process and its sub-processes, product renewal and product development
- have an understanding of the relevance of this knowledge in an industrial context
- have such insights into methods and techniques in product innovation that students can determine their role and importance in a specific product renewal and product development project

Competences and skills

For a passing grade the student must

- independently and in group be able to analyze the need for product renewal in small and medium sized companies
- independently and in group be able to structure and plan the implementation of a product renewal project
- for an industrial company, in the form of a group project, actively participate in all parts of the implementation of a product renewal project of moderate complexity
- based on a mission statement, independently or in group, be able to structure, plan and implement the part of the product development work which is contained in the various phases of the product development process
- for an industrial company, be able to orally and in writing, individually and in group, report the results from a product renewal and product development project - in terms of results and process

Judgement and approach

For a passing grade the student must

- demonstrate the ability to critically reflect on their own conducted product renewal and product development project
- demonstrate the ability to independently assess the possibilities and limitations of the methods and tools presented in the course
- demonstrate the ability to critically reflect on and, if necessary, also be able to suggest improvements to existing product innovation process models

Contents

Based on a general model of the industrial development process of products, the product innovation course starts directly by grouping the students in teams before the industrial development project is launched. In parallel to the project work, the product renewal process is introduced (a process specific to small and medium sized companies that corresponds in general to the traditional product planning process). As part of this process, a suitable portfolio of development projects is generated, based on the company's product policy (itself derived from the company's overall business goals and from a market analysis). In the subsequent part of the course, the product development process is treated, with emphasis on the initial principle or, alternatively put, concept development phase, but also including its other phases if relevant for the actual project. Note that the implementation of the product development part of the project under normal conditions is very comprehensive and focuses primarily on the product solution as such and not, as in the course MMKF01, on the process. In the final part of the course the students deepen their knowledge on a number of recognized methods and tools (with emphasis on sustainable product development) utilizing the latest research results in the field. The project consists, in other words, of the following two parts: the product renewal and

the product development projects. In the second part of the project, covering both concept development but also including elements from the later phases such as development of product architecture and detailed design, the students develop one of the product proposals derived from their product renewal project. The project is presented in the form of a group report, as well as orally by the entire team in front of the other teams and to the participating companies. The project is carried out by teams of 4-6 students per team.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: The course includes a compulsory industrial project, which is carried out in groups of 4-6 students. The project work is graded with the TH scale (Fail, 3, 4 or 5). The project grade corresponds to the final grade of the course.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Admission requirements:

- EEMA01 Biomedical Design or FAFF05 Project Engineering at the Nanoscale or MMKF01 Product Development and Design Methodology or MMKF05 Product Development and Design Methodology

The number of participants is limited to: No

Reading list

- Selection of journal articles, or e-books, which can be obtained in LUBSearch or through the lecturing staff.
- K.Ulrich & S. Eppinger: Product Design and Development. McGraw-Hill International Edition, 2012, ISBN: 978-007-108695. 5th edition. Alternatively 4th edition (2008), 6th edition (2015) or 7th edition (2020). The 5th edition is available as an e-book at the UK McGrawHill homepage only: <http://www.mheducation.co.uk/> (<http://www.mheducation.co.uk/9780077143961-emea-ebook-product-design-and-development>).

Contact and other information

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Course homepage: <http://www.product.lth.se/education/courses/>