

Course syllabus

Utvecklingsmetodik Product Development and Design Methodology

MMKF05, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED M

Date of Decision: 2023-04-11

General Information

Main field: Technology.

Elective Compulsory for: I3

Elective for: MPRR2

Language of instruction: The course will be given in English

Aim

The course objective is to give the student basic knowledge on strategies, terminology and methodology associated in with product development. The course also provides some basic understanding of the engineering design process, in the form of procedures, methods and techniques utilized in the concept development phase of the product development process. The course provides further basic knowledge on the development of a so-called business case (support to the go/no-go decision of develop and commercialize the devised concept) and on project management. Students should also have acquired the ability to apply these skills in an industrial context. Furthermore, the student should also have acquired insights into the importance of product development in a manufacturing company with respect to its growth and success in the market place and its role and relevance to society's growth and wealth.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- acquired knowledge and understanding of strategies, terminology and methodology of the product development process as well as in engineering

design methodology

- acquired basic knowledge and understanding on project management
- have an understanding of the relevance of this knowledge in an industrial context
- have such insights into methods and techniques within engineering design methodology that the student, independently or in group, can determine their role and importance in a specific development and engineering design project

Competences and skills

For a passing grade the student must

- for an industrial company, in the form of a group project, be able to structure, plan and implement the concept development phase of a product development project
- for an industrial company, be able to orally and in writing, individually and in a group, report the results from a 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 the result of their own conducted product development project
- demonstrate the ability to assess the importance of product development in a manufacturing company with respect to its growth and success and its role and relevance to society's growth and wealth

Contents

Based on a general model of the industrial development process, an overview of how an industrial company develops a suitable portfolio of development projects based on the overall business goals set out for the company is given. In the following part of the course the development process is introduced in some detail, with emphasis on the concept development phase. The engineering design methodology, critical for the development process, is given in an overall perspective, with emphasis here laid on its use in the concept development phase. Some of the latest research outcomes in the field of product development are introduced, such as sustainable product development. The students receive herewith a first insight into research in product development. In the final part of the course, the students get tools to build a so-called business case (support to the go/no-go decision of develop and commercialize the devised concept) as well as basic knowledge on project management, especially product planning.

Initially the theory of product development is introduced, after which an application project with focus on the concept development phase is carried out. This project is performed, if possible, in cooperation with an industrial company. Alternatively, the project is carried out within a virtual company, to provide the industry-oriented character of the project. The project consists in two parts. The first part is carried out in study period 3 (läsperiod 3 or VT1) together with the students of the Mechanical Engineering program in groups of 5-6 students. 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 second part is carried out in study period 4 (läsperiod 4 or VT2). The students continue the project: concept testing is performed and a business case is built and reported.

Examination details

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

Assessment: The course includes a compulsory project. The project consists in two parts. The first part is carried out in study period 3 (läsperiod 3 or VT1) together with the students of the Mechanical Engineering / Mechanical Engineering with Industrial

Design Engineering programs in groups of 5-6 students. The second part is carried out in study period 4 (läsperiod 4 or VT2). During the project, the students apply the conceptual development process taught in the course by developing a full concept and a business case from a product idea. The complete project is graded Fail, 3, 4 or 5. All group members from the Industrial Engineering program receive the same project grade. In addition, the students must pass an individual written examination. The written exam aims at control the students' knowledge breadth and depth at the individual level. Note that the written exam is carried out during the course, after that the lectures on the theory have been taught. This is to secure that all students possess the theoretical knowledge necessary to carry out successfully the product development project. The grades for the written exam are Fail or Pass. In order to pass the course, the student must have passed both the project and the exam. In principle, the project grade becomes the final grade. A high exam score can nevertheless increase the final grade in the two following ways: Any student with a project grade 3 and a high exam score gets the final grade 4 and any student with a project grade 4 and a high exam score gets the final grade 5.

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.

Parts

Code: 0119. **Name:** Project.

Credits: 4,5. **Grading scale:** TH. **Assessment:** All group members receive the same grade earned on the project. **Contents:** See section Assessment above.

Code: 0219. **Name:** Written Examination.

Credits: 3. **Grading scale:** UG. **Assessment:** The exam is digital but takes place on campus (not online). The students bring their own laptop or use a campus computer in a specified computer room. The retakes may be given on paper depending on the number of students. Written individual examination. **Contents:** The written exam aims at control the students' knowledge breadth and depth at the individual level.

Further information: The date and time of the exam is announced by the lecturing staff.

Admission

The number of participants is limited to: No

The course overlaps following course/s: MMK110

Reading list

- K.Ulrich & S. Eppinger: Product Design and Development. McGraw-Hill International Edition, 2012, ISBN: 978-007-108695 (paper) / 9780077143961 (e-book). 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>).
- Selection of journal articles, which can be obtained in LUBSearch.

Contact and other information

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