

## Machine and Product Design

Code: MK5MGTTG05GX17\_EN

ECTS Credit Points: 5

Evaluation: exam

Year, Semester: 1<sup>st</sup> year, 2<sup>nd</sup> semester

Its prerequisite(s): -

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 3+2

### Topics:

The goal of the subject is to show the process of machine design, the properties and possibilities of methodical design. Students get acquainted with the main design strategies, and their properties, with process and main steps of the discursive strategy. Birth of the product idea, design of the product, building up of the requirements, techniques of looking for solution principles and combination of principles. Students will be able to choose the right solutions using the technical valuating methods. They acquire the basic rules and guidelines of design, which helps to create constructions suitable for manufacturing and assembly. In practices the goal is to show how the theory functioning in the practice. Students solve design tasks following the steps of design methodology.

### Literature:

Compulsory:

- G.Pahl and W. Beitz: Engineering Design: A Systematic Approach Translated by Arnold Pomerans and Ken Wallace, The Design Council London, 1988, ISBN 0 85072 239x

Recommended:

- Koller R.: Design Method for Machine, Device and Apparatus Construction, Springer-Verlag, Berlin/Heidelberg, 1979
- Amaresh Chakrabarti: Engineering Design Synthesis; Understanding, Approaches and Tools, Springer, 2002, ISBN: 978-1-84996-876-8 (Print) 978-1-4471-3717-7 (Online)

### Schedule

**1<sup>st</sup> week:** Registration week

**2<sup>nd</sup> week:**

**Lecture:** Stages of Technical lifetime of products. Functions of products.

**Practice:** issuing the 1. task. Compilation of requirements.

**4<sup>th</sup> week:**

**Lecture:** Design strategies. The demand for methodical design.

**Practice:** Analysis of functions of products. The list of requirements.

**6<sup>th</sup> week:**

**Lecture:** Conception design. Abstraction of the task.

**3<sup>rd</sup> week:**

**Lecture:** General process flow of the design process.

**Practice:** Analysis of functions of products. The list of requirements.

**5<sup>th</sup> week:**

**Lecture:** Product design, specification of the task, Compilation of system of requirements.

**Practice:** Issuing the home assignment.

**7<sup>th</sup> week:**

**Lecture:** The structure of the functions.

**Practice:** The process flow of the design process.

**8<sup>th</sup> week:** 1<sup>st</sup> drawing week

**9<sup>th</sup> week:**

**Lecture:** Looking for solution principles, combination of principles. Selection of the suitable variations.

**Practice:** Building up variations of solutions.

**11<sup>th</sup> week:**

**Lecture:** mid-term test

**Practice:** elaborating the home assignment

**13<sup>th</sup> week:**

**Lecture:** Guidelines of construction for proper design regarding manufacturing and assembly.

**Practice:** presentation of the home assignment.

**15<sup>th</sup> week:** 2<sup>nd</sup> drawing week

**Practice:** Building up the structure of the functions.

**10<sup>th</sup> week:**

**Lecture:** Technical valuating. Valuating methods in the design process.

**Practice:** Technical valuating. Choosing the right solution.

**12<sup>th</sup> week:**

**Lecture:** Basic rules and principles of construction.

**Practice:** elaborating the home assignment

**14<sup>th</sup> week:**

**Lecture:** Technical documentation-systems. Principles of preparing the technical documentation.

**Practice:** presentation of the home assignment.

## Requirements

A, for a signature:

Attendance on the lectures is recommended, but not compulsory.

Participation at practice is compulsory. Student must attend the practices and may not miss more than three practice during the semester. In case a student misses more than three, the subject will not be signed and the student must repeat the course. Active participation is evaluated by the teacher in every class. If student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate their participation as an absence due to the lack of active participation in class.

Students have to submit all the design tasks as scheduled minimum on a sufficient level.

During the semester there is an end-term test.

B, for grade:

The course ends in exam.