MM3221

Study program / course: Mechanical Engineering

Type and level of study: Master academic studies

Course: Design Methods

Lecturers: Marjanovic Nenad

Status of course: Elective for module M2, III semester

Number of ECTS:6

Precondition: Fundamentals of Machine Design

The objective of course

The aim of this course is to introduce students in mechanical systems design process. Attainment will make students possible for further improvement in specific machine systems design. Knowledge of system design area, design process and phases of design process is base for successful design of machine systems. Throughout creating of independent works, students should get know and fill steps through will get along in real machine systems design.

The outcome of course

Basic knowledge about design methods, design types, and design work organization, product planning and clarification of task, establishing function structures, searching for solution principles, creating and evaluating concept variants, basic rules and principles of embodiment design, basic rules and principles of detail design, optimization of machine systems.

Syllabus

Theoretical study

Design types, and design work organization. Systematic design. Design process. Product planning and clarification of task. Conceptual design. Function structures. Searching for solution principles. Creating and evaluating concept variants. Choice of optimal concept variant. Embodiment design. Basic rules and principles of embodiment design. Dimensioning and forming of machine parts. Influences on embodiment design. Detail design. Design documentation. Machine systems optimization. Mathematical optimization methods. Nonlinear programming. Multicriterion optimization.

Practical classes

Solving of practical problems, instructions for homework and their verifying. The homework are from next areas: Defining and clarification of task, conceptual design and embodiment design.

Recommended reading

1.Marjanovic N., **Design Methods**, Faculty of Mechanical Engineering, Kragujevac, 1999.

2. Pahl G., Betz W., Engineering Design, Springer Verlag, Berlin, 1977.

The number of hours of active teaching:				Other classes: 1
Theory: 3	Practical classes: 1.4	Other forms of teaching: 0.6	Research study:0	

Methods of teaching

Lectures, exercises, individual homework, tests and final test.

Through lectures, students get basic information about theoretical basics, while through exercises the students solving the practical problems.

Evaluation of knowledge

Pre-final exam obligations	**points**	**Final exam**	**points**
Activities during the classes:	**10**	written exam	**50**
Practical classes:	**40**		
Colloquiums(s) :	**50**		
Seminar(s) :			