# Course description

Course abbreviation:	KKS/NEK Methods and t	ools for effectiv	ve design			Page:	1 / 3	
Academic Year:	2023/2024		e design		Printed:	11.07.2025	5 09:34	
Department/Unit /	KKS / NEK				Academic Year	2023/2024	ł	
Title	Methods and tools for effective design				Type of completion	Pre-Exam Credit		
Long Title	Methods and tools for effective design engineering							
Accredited/Credits	Yes, 2 Cred.				Type of completion	Combined		
Number of hours	Tutorial 2 [Hours/Week]							
Occ/max	Status A	Status B	Status C		Course credit prior to	No		
Summer semester	0 / -	0 / -	0 / -		Counted into average	NO		
Winter semester	0 / -	0 / -	0 / -		Min. (B+C) students	10		
Timetable	Yes				Repeated registration	NO		
Language of instruction	Czech				Semester taught	Summer s	emester	
Optional course	Yes				Internship duration	0		
Evaluation scale	S N							
No. of hours of on-premise								
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.							
Periodicity	every year							
Specification periodicity								
Substituted course	None							
Preclusive courses	N/A							
Prerequisite courses	N/A							
Informally recommended courses N/A								
Courses depending	on this Course	N/A						

# Course objectives:

The aim of the course is to provide students with a system of methodical knowledge to support effective design engineering of technical products. The participants gain the knowledge on the system of design engineering activities (clarification of the task, searching for solution, evaluation and decision making, solution communication, verification and checking, etc.) and learn to apply fundamental methods and tools that enable them to successfully cope with these in the highly effective way. In contrast to traditional procedural design methodology, design methods and tools are classified into the rational hierarchical system. It strongly enhances the student's ability of system thinking and supports a creative approach to applying these methods and tools in the various design tasks.

# Requirements on student

Continuous assessment:

- minimal 75% active participation in seminars (only for presence studies)
- fulfilment of the tutorial tasks assignment until the limit deadline at the latest

#### Content

- 1. "Make a start" basic information on the course, introductions
- 2. "Get together" exercise of engineering design team cooperation

3. "Be part of a (great) team" - cooperation, working group vs. team, potential of individuals and team, communication in team, dynamics of team

4. "Designing" - aim, structure of design engineering activities, design exercise assignment

5. "Parallel support of design operations" - verification and checking, representation, collection and elaboration of information, management

- 6. "Clarification of the Task" aim, methods, exercise
- 7. "Searching for solution" aim, strategies, methods, exercise
- 8. "Revealing creativity" creativity, influencing factors, training

- 9. "Evaluation and decision making" aim, general approach, exercise
- 10. "Solution communication" aim, approaches, design project documentation, protection of intellectual property
- 11. "Presentation" seeking inspiration from video talks, design of presentation, ppt presentation examples
- 12. "Revealing presentation skills" individual presentation
- 13. "Reflections" discussion

## Fields of study

# Guarantors and lecturers

• Guarantors: prof. Ing. Stanislav Hosnedl, CSc. (100%)

#### Literature

• Basic:	Hosnedl, S. Systémové navrhování technických produktů. Plzeň, ZČU, FST, 2009.
• Recommended:	Bradbury, Andrew. Jak úspěšně prezentovat a přesvědčit. Brno : Computer Press, 2007. ISBN 978-
	80-251-1622-7.
<ul> <li>Recommended:</li> </ul>	Hubka, Vladimír. Konstrukční nauka : obecný model postupu při konstruování. Zürich : Heurista,
	1995. ISBN 80-901135-0-8.
<ul> <li>Recommended:</li> </ul>	Chalupa, Bohumír. Tvořivé myšlení : tvořivost jako dobrodružství poznání. Vyd. 1. Brno : Barrister &
	Principal, 2005. ISBN 80-7364-007-4.

# Time requirements

All forms of study		
Activities	Time requirements for activity [h]	
Graduate study programme term essay (40-50)	40	
Contact hours	26	
Total:	66	

#### assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

Skills demonstration during practicum

Individual presentation at a seminar

## prerequisite

## Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

be well informed in the basic preparatory subjects of mechanical education

design general machine parts on the level of engineering design knowledge in the bachelor study

understand the basic knowledge of strength and deformation calculations of general machine parts

#### Skills - students are expected to possess the following skills before the course commences to finish it successfully:

represent engineering design ideas and solutions in the form of sketches

perform the basic static, kinematic, strength and deformation calculations of basic general machine parts

work with basic MS Office SW modules

# teaching methods

#### Knowledge - the following training methods are used to achieve the required knowledge:

Seminar

Individual study

Students' portfolio

# learning outcomes

## Knowledge - knowledge resulting from the course:

describe and explain the decomposition of engineering designing of a technical product into basic serial and parallel operations of a general creative problem solving

describe and explain the requirements specification on the designed technical product focused on its key properties

describe and explain the prediction and evaluation of the basic properties of the designed technical product

describe and explain the evaluation and objective selection of the most appropriate alternative of the designed technical product

## Skills - skills resulting from the course:

design a simple technical product using basic operations of a general creative problem solving

solve basic engineering design operations in a creative way with the support of corresponding basic methods and SW tools

document, present and justify in a rational and comprehensible manner the process and results of the engineering design of a technical product

## Course is included in study programmes: