

# Course description

<b>Course abbreviation:</b>	KKS/KPP	<b>Page:</b>	1 / 4
<b>Course name:</b>	Computer-Aided Design		
<b>Academic Year:</b>	2023/2024	<b>Printed:</b>	11.07.2025 10:22

<b>Department/Unit /</b>	KKS / KPP			<b>Academic Year</b>	2023/2024
<b>Title</b>	Computer-Aided Design			<b>Type of completion</b>	Exam
<b>Accredited/Credits</b>	Yes, 4 Cred.			<b>Type of completion</b>	Combined
<b>Number of hours</b>	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]				
<b>Occ/max</b>	Status A	Status B	Status C	<b>Course credit prior to</b>	Yes
<b>Summer semester</b>	0 / -	0 / -	0 / -	<b>Counted into average</b>	YES
<b>Winter semester</b>	30 / -	0 / -	1 / -	<b>Min. (B+C) students</b>	10
<b>Timetable</b>	Yes			<b>Repeated registration</b>	NO
<b>Language of instruction</b>	Czech			<b>Semester taught</b>	Winter semester
<b>Optional course</b>	Yes			<b>Internship duration</b>	0
<b>Evaluation scale</b>	1 2 3 4			<b>Ev. sc. – cred.</b>	S N
<b>No. of hours of on-premise</b>					
<b>Auto acc. of credit</b>	Yes in the case of a previous evaluation 4 nebo nic.				
<b>Periodicity</b>	every year				
<b>Specification periodicity</b>					
<b>Substituted course</b>	KKS/SKC				
<b>Preclusive courses</b>	N/A				
<b>Prerequisite courses</b>	N/A				
<b>Informally recommended courses</b>	KKS/CAE				
<b>Courses depending on this Course</b>	KKS/ZSZDM, KKS/ZSZK4, KKS/ZSZK5, KME/SZVDK				

## Course objectives:

The aim of the subject is to deepen the knowledge of Bc. study about the following areas:  
 PLC (product lifecycle) systems, solid, hybrid and sheet metal part design, assembly design and drafting, product synthesis - digital mockup, equipment & systems engineering, shape design & styling - products to create, control and modify mechanical & freeform surfaces, knowledgeware products; NC manufacturing, designer-oriented part & assembly; optimization of the production facility layout.

## Requirements on student

Requirements for the successful completion of the course: terminal project - min. 6 modules (including mechanism, advance surfaces, family tables and profiles)  
 Final assessment: examination (test of knowledge) - Only those who have successfully met the requirements in terminal project will be permitted to take the examination.

## Content

Short Description:  
 creation of volumetric, combined and thin-walled parts, large assemblies and drawings, assembling of assemblies - digital model, equipment and system engineering, shape design and styling - product creation, management and modification of mechanical & freeform surfaces, knowledge products - capture and reuse of company know how to improve the entire product life cycle, NC machining, analysis - stress and vibration analysis for initial verification of designed parts and assemblies, optimizing plant location in the plant

### Lectures

1. Introduction to content and requirements. International standards, company standards, recommendations and methodology
2. Working with surfaces
3. Rapid prototyping, principles of reverse engineering

4. Sheet metal modeling - thin-walled parts
5. Shape design and styling
6. Knowledge products - derived parts
7. Welds
8. Render
9. NC machining
10. Analyzes and mechanisms
11. Animation
12. Cabling, piping systems
13. Forms

Exercise:

1. Introduction to content and requirements. International standards, company standards, recommendations and methodology
2. Working with surfaces
3. Sheet metal modeling - thin-walled parts
4. Shape design and styling
5. Knowledge products - derived parts
6. Render
7. Welds
8. Analyzes and mechanisms
9. Animation
10. Forms
11. Cabling, piping systems
12. NC machining
13. control of semestral works

## Fields of study

viz COURSEWARE

## Guarantors and lecturers

- **Guarantors:** doc. Ing. Zdeněk Chval, Ph.D. (100%)
- **Lecturer:** doc. Ing. Zdeněk Chval, Ph.D. (100%), doc. Ing. Karel Ráž, Ph.D. (100%)
- **Tutorial lecturer:** doc. Ing. Zdeněk Chval, Ph.D. (50%), doc. Ing. Karel Ráž, Ph.D. (100%)

## Literature

- **Basic:** Hynek, Martin. *KKS/KPP NX Unigraphics-MECHANISMUS*. 1. vyd. Plzeň : Západočeská univerzita, 2012. ISBN 978-80-261-0105-5.
- **Basic:** Hynek, Martin. *KKS/KPPNX - Modul plochy. Vysyvač*. 1. vyd. Plzeň : Západočeská univerzita, 2011. ISBN 978-80-7043-990-6.
- **Extending:** Utz, James; Cox, W. Robert. *Inside Pro/Engineer : profesionální průvodce systémem Pro/Engineer*. 1. čes. vyd. Přerov : ISICAD, 1995. ISBN 80-900074-6-5.
- **Recommended:** Fořt, Petr; Kletečka, Jaroslav. *Autodesk Inventor : funkční navrhování v průmyslové praxi*. 2., aktualiz. vyd. Brno : Computer Press, 2007. ISBN 978-80-251-1773-6.
- **Recommended:** Hynek, Martin. *KKS/KPP CATIA v5 - Modul plochy-vysavač*. 1. vyd. Plzeň : Západočeská univerzita, 2011. ISBN 978-80-261-0080-5.
- **Recommended:** Hynek, Martin. *KKS/KPP NX Unigraphics-Sheetmetal*. 1. vyd. Plzeň : Západočeská univerzita, 2012. ISBN 978-80-261-0123-9.
- **Recommended:** Rusiňák Miroslav. *Solid Edge V20 UGS - učebnice*. 2007. ISBN 978-80-239-9382-0.
- **Recommended:** Vlácilová, Hana. *SolidWorks*. Brno : Computer Press, 2006. ISBN 80-251-1314-0.
- **Recommended:** Učební texty, příklady a informace k CAD systémům na stránkách portálu (Hynek, M. a kolektiv) - portal.zcu.cz >

## Time requirements

### All forms of study

Activities	Time requirements for activity [h]
Practical training (number of hours)	26

Individual project (40)	80
<b>Total:</b>	<b>106</b>

### assessment methods

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

- Seminar work
- Individual presentation at a seminar

#### Skills - skills achieved by taking this course are verified by the following means:

- Seminar work

### prerequisite

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

- acquire independently further professional knowledge by independent study of theoretical knowledge of engineering basis
- basic knowledge of 3D CAD system (creation of parts, assemblies and drawings)
- to decide on the basis of a framework assignment independently and responsibly in the context only partially known
- to provide experts and laymen with clear and convincing information about technical problems with the help of 3D CAD systems
- use independently theoretical knowledge of 3D modeling of parts and assemblies
- use your expertise in at least one foreign language

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

- apply their own knowledge of 3D CAD systems (solid modeling, creation of assemblies and drawings) to solve practical problems in the field of designing machines and equipment

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

- N/A
- N/A
- N/A

### teaching methods

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

- Self-study of literature
- Interactive lecture
- Lecture supplemented with a discussion

#### Skills - the following training methods are used to achieve the required skills:

- Practicum
- Individual study

### learning outcomes

#### Knowledge - knowledge resulting from the course:

- Students will gain the assumptions for solving advance and more difficult technical tasks by help of PLC(product lifecycle) systems of technical practise.
- can communicate in a comprehensible and convincing way to experts and laymen information on professional problems with the help of PLC systems
- use independently theoretical knowledge of system approach and problem solving cycle (procedures and methods) in PLC (product life cycle) systems with emphasis on personnel, information, technical and organizational factors of the design process and with respect to CAD

#### Skills - skills resulting from the course:

- apply their own knowledge of PLC systems (design of jigs and molds, mechanism simulations, photorealistic presentations of future products, ergonomics, standardization, NC machining, sheet metal bending - to solve practical problems in the field of

machine and equipment design

### Competences - competences resulting from the course:

N/A

N/A

### Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Applied Mechanics	Postgraduate Master	Full-time	Výpočty a design konstrukcí	1	2018 akr	2023	Povinné předměty - specializace	A	1	ZS
Certifikátové programy	Postgraduate Master	Full-time	Product Lifecycle Management	1	1	2023	Povinné předměty	A		ZS
Design Engineering of Machines and Technical Devices	Postgraduate Master	Combined	Design Engineering of Health and Cooperative Technology	1	2020	2023	Compulsory courses	A	1	ZS
Design Engineering of Machines and Technical Devices	Postgraduate Master	Full-time	Design Engineering of Health and Cooperative Technology	1	2020	2023	Compulsory courses	A	1	ZS
Design Engineering of Machines and Technical Devices	Postgraduate Master	Full-time	Design Engineering of Manufacturing Machines and Equipment	1	2020	2023	Compulsory courses	A	1	ZS
Design Engineering of Machines and Technical Devices	Postgraduate Master	Combined	Design Engineering of Manufacturing Machines and Equipment	1	2020	2023	Compulsory courses	A	1	ZS
Design Engineering of Machines and Technical Devices	Postgraduate Master	Full-time	Design Engineering of Vehicles and Handling Machinery	1	2020	2023	Compulsory courses	A	1	ZS
Design Engineering of Machines and Technical Devices	Postgraduate Master	Combined	Design Engineering of Vehicles and Handling Machinery	1	2020	2023	Compulsory courses	A	1	ZS
Applied Mechanics	Postgraduate Master	Full-time	Dynamika konstrukcí a mechatronika	1	2018 akr	2023	Volitelné předměty - specializace (doporučené)	C	1	ZS