

Course description

Course abbreviation:	KPV/PPVS	Page:	1 / 4
Course name:	Comp. Support in Mech. Engineering		
Academic Year:	2023/2024	Printed:	03.06.2024 10:08

Department/Unit /	KPV / PPVS			Academic Year	2023/2024
Title	Comp. Support in Mech. Engineering			Type of completion	Pre-Exam Credit
Accredited/Credits	Yes, 4 Cred.			Type of completion	Combined
Number of hours	Lecture 2 [Hours/Week] 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	92 / -	0 / -	0 / -	Min. (B+C) students	10
Timetable	Yes			Repeated registration	NO
Language of instruction	Czech			Semester taught	Winter semester
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	K				
Substituted course	KPV/PPR2				
Preclusive courses	KPV/PPVSA				
Prerequisite courses	N/A				
Informally recommended courses	KPV/TI or KPV/9TI				
Courses depending on this Course	N/A				

Course objectives:

The course is intended to give students a good insight into the following areas:
Event driven programming, file and database processing, linear and non-linear general data structures and apply these knowledge to usage of data structures in mechanical engineering and algorithms of their processing.

Requirements on student

Conditions for obtaining credit:

- participation on seminars
- passing the tests

Examination requirements: The course is not completed with an exam, but the credit.

Detailed requirements are at coursware.

Content

Excel charts and formulas, pivot tables and charts. Introduction to data processing, formats and data processing, classical batch data processing, linear, tree and network data structures. Basics of database data processing. Data structures in engineering: order, BOM and process. Algorithms of data structures processing in mechanical engineering. Independent work in a simple database system. Basic SQL queries.

1. Basic concepts of database processing, functional, data and object analysis
2. Conceptual modeling, E-R-A diagram,
3. Database models, relational model, transformation of KS into RDB model, data normalization
4. SQL language, formulation of queries, SQL examples
5. Possibilities of database corruption (technical, program, user), multi-user access to data
6. Application of simulation in mechanical engineering - case studies

7. Application of visualization and virtual reality in mechanical engineering
 8. Linear data structures, tree and network data structures
 9. Basic data structures in engineering, BOM, procedure, order and algorithms for their processing - initiation
 10. Basic data structures in engineering, BOM, procedure, order and algorithms for their processing - completion
 11. Examples of data structures in various information systems
 12. Information system Helios Orange and its use in logistics and production management
 13. Credit test
- Any changes in content and timing will be sent electronically.

Fields of study

Guarantors and lecturers

- **Guarantors:** Doc. Ing. Pavel Kopeček, CSc. (100%)
- **Lecturer:** Doc. Ing. Petr Hořejší, Ph.D., Doc. Ing. Pavel Kopeček, CSc. (100%), Doc. Ing. Pavel Raška, Ph.D. (100%)
- **Tutorial lecturer:** Doc. Ing. Petr Hořejší, Ph.D. (40%), Doc. Ing. Pavel Kopeček, CSc. (25%), Ing. Tomáš Macháč (100%), Ing. Bc. Miroslav Malaga, Ph.D. (100%), Doc. Ing. Pavel Raška, Ph.D. (35%)

Literature

- **Basic:** Ryant, Ivan. *Algoritmy a datové struktury objektově*. Vydání první. 2017. ISBN 978-80-270-1660-0.
- **Basic:** Kroenke, David; Auer, David J. *Databáze*. 1. vydání. 2015. ISBN 978-80-251-4352-0.
- **Basic:** Kopeček, Pavel. *Modelování a optimalizace datových struktur ve strojírenství*. [Plzeň] : SmartMotion, 2013. ISBN 978-80-87539-50-7.
- **Basic:** Kopeček, Pavel. *Příklad v MS Access*. [Plzeň] : SmartMotion, 2013. ISBN 978-80-87539-51-4.
- **Basic:** Kopeček, Pavel; Holub, Vojtěch. *Úvod do zpracování dat*. [Plzeň] : SmartMotion, 2013. ISBN 978-80-87539-49-1.
- **Extending:** Hernandez, Michael J.; Viescas, John. *Myslíme v jazyku SQL : tvorba dotazů*. Praha : Grada Publishing, 2004. ISBN 80-247-0899-X.
- **Extending:** DeBarros Anthony. *Practical SQL: A Beginner's Guide to Storytelling with Data*. No Starch Press, 2018. ISBN 978-1593278274.
- **Extending:** Oppel, Andrew J. *SQL bez předchozích znalostí : [průvodce pro samouky]*. Vyd. 1. Brno : Computer Press, 2008. ISBN 978-80-251-1707-1.
- **Recommended:** Kruczek, Aleš. *Microsoft Access 2010 : podrobná uživatelská příručka*. Vyd. 1. Brno : Computer Press, 2010. ISBN 978-80-251-3289-0.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
E-learning [dáno e-learningovým kurzem]	10
Preparation for formative assessments (2-20)	12
Contact hours	52
Preparation for comprehensive test (10-40)	30
Total:	104

assessment methods

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

Test

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

Skills demonstration during practicum

prerequisite

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

- understand what algorithmization is
- have basic knowledge of working with files
- master any procedural language of the 3rd generation

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

- be able to work with MS Office tools (Word, Excel)
- be able to work with PC
- be able to write and debug a simple program application for working with files in a higher language

teaching methods

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

- E-learning
- Multimedia supported teaching
- Individual study
- One-to-One tutorial
- Interactive lecture

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

- Cooperative instruction

learning outcomes

Knowledge - knowledge resulting from the course:

- to know the basic concepts of database data processing
- to know what general linear and nonlinear data structures are
- to know what data structures in mechanical engineering (BOM, process, order) are
- to know the methods of determining the amount, cost and running time from data structures

Skills - skills resulting from the course:

- perform data analysis of simple data processing tasks
- propose a simple database in MS ACCESS
- use SQL to work with databases
- work with macros in MS ACCESS

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Mechanical Engineering	Bachelor	Full-time	Design Engineering of Power Machines and Equipment	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Combined	Design Engineering of Machines and Technical Devices	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Full-time	Design Engineering of Machines and Technical Devices	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Combined	Engineering Materials and Manufacturing Technology	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Full-time	Engineering Materials and Technology	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Full-time	Industrial Engineering and Management	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Combined	Mechanical Engineering	1	2020	2023	Compulsory courses	A	2	ZS

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Mechanical Engineering	Bachelor	Full-time	Mechanical Engineering	1	2020	2023	Compulsory courses	A	2	ZS
Mechanical Engineering	Bachelor	Full-time	Technology of Metal Cutting	1	2020	2023	Compulsory courses	A	2	ZS