

Module Handbook (<https://modhb.uni-kl.de/>)

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Notes on the module handbook of the department Mechanical and Process Engineering

Die hier dargestellten veröffentlichten Studiengang-, Modul- und Kursdaten des Fachbereichs Maschinenbau und Verfahrenstechnik ersetzen die Modulbeschreibungen im KIS und wurden mit Ausnahme folgender Studiengänge am 28.10.2020 verabschiedet.

Ausnahmen:

- BSc. Bio- und Chemieingenieurwissenschaften (Stand WS 20/21): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_BSc_BCI.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_BSc_BCI.pdf)
- BEd. Lehramt Metalltechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Bachelor_Lehramt_Metalltechnik.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Bachelor_Lehramt_Metalltechnik.pdf)
- MSc. Bio- und Chemieingenieurwissenschaften (Stand WS 20/21): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_Msc_BCI.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_Msc_BCI.pdf)
- MEd. Lehramt Metalltechnik Werkstoffe und Fertigung (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Werkstoffe_und_Fertigung.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Werkstoffe_und_Fertigung.pdf)
- MEd. Lehramt Metalltechnik Maschinen- und Fahrzeugtechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Fahrzeugtechnik.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Fahrzeugtechnik.pdf)
- MEd. Lehramt Metalltechnik Verfahrenstechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Verfahrenstechnik.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Verfahrenstechnik.pdf)

Module MV-VPE-17-M-4

Information technology for mechanical engineers (M, 5.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MV-VPE-17-M-4	<i>Information technology for mechanical engineers</i>	5.0 CP (150 h)

Basedata

CP, Effort	5.0 CP = 150 h
Position of the semester	1 Sem. in SuSe
Level	[4] Bachelor (Specialization)
Language	[DE] German
Module Manager	Göbel, Jens-Christian, Prof. Dr.-Ing. (PROF DEPT: MV) (/staff/312/)
Lecturers	Göbel, Jens-Christian, Prof. Dr.-Ing. (PROF DEPT: MV) (/staff/312/)
Area of study	[MV-VPE] Virtual Product Engineering
Reference course of study	[MV-82.103-SG] B.Sc. Mechanical Engineering (/mhb/FB-MV/cos-508/)
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V+2U	MV-VPE-86704-K-4 (/mhb/courses/MV-VPE-86704-K-4/)	P	-	PL1	5.0	SuSe

- About **[MV-VPE-86704-K-4]**: Title: "Information technology for mechanical engineers"; Presence-Time: 56 h; Self-Study: 94 h

Examination achievement PL1

- Form of examination: **written exam (Klausur) (90 Min.)**
- Examination Frequency: each semester
- Examination number: 10704 ("Informationtechnology for Mechanical Engineering")

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From **[MV-VPE-86704-K-4] Information technology for mechanical engineers** (/mhb/courses/MV-VPE-86704-K-4/):

- Mathematical and technical foundations (number representation, encoding, ...)
- Basics of computer architecture and hardware
- Basics of software development
- Object-oriented analysis and object-oriented design
- Model-Based Systems Engineering (MBSE) with SysML and MagicDraw
- Programming languages and techniques
- Programming with python or Matlab and Simulink
- Data structures and algorithms
- Computer networks

Competencies / intended learning achievements

From **[MV-VPE-86704-K-4] Information technology for mechanical engineers** (/mhb/courses/MV-VPE-86704-K-4/):

1. Lecture:

Students will be able to ...

- ... describe the basics of electronic data processing
- ... enumerate the basic elements of computer architectures
- ... explain the mathematical and technical mode of operation of computers
- ... state the general principles of programming languages and techniques
- ... explain principles and methods of software development
- ... compare simple algorithms and show connections to the corresponding data structures
- ... describe the presented architectures of computer networks
- ... explain the methods and phases of Model-Based Systems Engineering.

2. Exercise Classes:

Students will be able to ...

- ... apply mathematical methods from the fundamentals of computer science
- ... implement the methods of Model-Based Systems Engineering on a simple example and develop the corresponding models with the help of SysML and MagicDraw
- ... implement the developed models using the methods of software development in python or Matlab and Simulink
- ... develop and implement simple algorithms using the knowledge of programming techniques, algorithms and data structures acquired in the lecture
- ... to coordinate in a group and to solve tasks together.

Literature

From [MV-VPE-86704-K-4] Information technology for mechanical engineers (/mhb/courses/MV-VPE-86704-K-4/):

- D.A. Patterson, J.L. Hennessy: Rechnerorganisation und -Entwurf – Die Hardware / Software-Schnittstelle, Spektrum Akademischer Verlag, 3. Aufl., 2005
- Bernd Oestereich: Objektorientierte Softwareentwicklung: Analyse und Design mit der Unified Modeling Language, R. Oldenbourg Verlag, 4. aktual. Aufl., 1998
- W. Zuser, T. Grechenig, M. Köhle: Software Engineering - mit UML und dem Unified Process
- Bernd Oestereich: Objektorientierte Softwareentwicklung – Analyse und Design mit der Unified Modeling Language), 4. akt. Auflage, Oldenbourg Verlag München– 1998
- S. O. Krumke, H. Noltemeier; Graphentheoretische Konzepte und Algorithmen, Teubner Verlag – 2005
- S. Tanenbaum: Computer-Netzwerke, Wolfram's Verlag – 1992
- E. Proebster: Rechnernetze - Technik, Protokolle, Systeme, Anwendungen, 2. Auflage, Oldenbourg Verlag München - 2002

Requirements for attendance (informal)

None

Requirements for attendance (formal)

None

References to Module / Module Number [MV-VPE-17-M-4]

Course of Study	Section	Choice/Obligation
[MV-82.103-SG] B.Sc. Mechanical Engineering (/mhb/FB-MV/cos-508/)	Ingenieurwissenschaftliche Grundlagen I (IWG I)	[P] Compulsory
[MV-82.814-SG] B.Sc. Mechanical Engineering with a minor in Economics (/mhb/FB-MV/cos-525/)	Ingenieurwissenschaftliche Grundlagen I	[P] Compulsory
Module-Pool	Name	
[MV-BCI-BSc-MV-MPOOL-4 (/mhb/modulepools/MV-BCI-BSc-MV-MPOOL-4/)]	Wahlpflichtmodule MV für Bachelor BCI	