

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-IMAD-30-M-4

Theory of Design I (M, 4.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MV-IMAD-30-M-4	<i>Theory of Design I</i>	4.0 CP (120 h)
MV-KIMA-30-M-4	<i>Theory of Design I</i>	4.0 CP (120 h)

Hint concerning Module MV-KIMA-30-M-4:
Number in examination regulations.

Basedata

CP, Effort	4.0 CP = 120 h
Position of the semester	1 Sem. in WiSe
Level	[4] Bachelor (Specialization)
Language	[DE] German
Module Manager	Stephan, Nicole, Dr.-Ing. (WMA DEPT: MV) (/staff/279/) Teutsch, Roman, Prof. Dr.-Ing. (PROF DEPT: MV, GS) (/staff/327/)
Lecturers	Stephan, Nicole, Dr.-Ing. (WMA DEPT: MV) (/staff/279/)
Area of study	[MV-iMAD] Mechanical and Automotive Design
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+1U	MV-IMAD-86252-K-4 (/mhb/courses/MV-IMAD-86252-K-4/)	P	-	PL1	4.0	WiSe

- About **[MV-IMAD-86252-K-4]**: Title: "Theory of Design I"; Presence-Time: 42 h; Self-Study: 78 h

Examination achievement PL1

- Form of examination: **written or oral examination**
- Examination Frequency: each semester
- Examination number: 10252 ("Mechanical Design Process I")

Written (60-90 minutes) or oral (30-45 minutes) examination, will be announced at the beginning of the course.

Evaluation of grades

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

Contents

From **[MV-IMAD-86252-K-4] Theory of Design I** (/mhb/courses/MV-IMAD-86252-K-4/):

- Methods of systematic design and planning according to VDI guidelines 2221, 2222 and 2225
- Requirements management
- Conceptual development (function structure, effective principles, solution principles, creativity techniques)
- Concept evaluation and selection
- Design guidelines
- Design examples
- further methodical approaches

Competencies / intended learning achievements

From [MV-IMAD-86252-K-4] Theory of Design I (/mhb/courses/MV-IMAD-86252-K-4/):

1. Lecture

Students will be able to

- describe the procedure of methodical design in detail
- design new products according to the standard VDI 2221
- formulate requirements as well as to develop requirement lists / requirement and functional specifications
- build up function structures and to develop principle solutions
- present solution concepts and explain tools for the evaluation and selection of concepts
- explain basic rules of design as well as design principles and design restrictions

2. Exercise

Students will be able to

- implement the topics covered in the lecture into practice using application examples and explain them to the exercise group
- develop requirement lists based on practical examples
- build up functional structures for technical systems
- develop, analyze and evaluate solution concepts
- create principle solutions by hand sketches

Literature

From [MV-IMAD-86252-K-4] Theory of Design I (/mhb/courses/MV-IMAD-86252-K-4/):

- SCHINDLER: Der allgemeine Konstruktionsprozess - Grundlagen des methodischen Konstruierens, in RIEG: Handbuch Konstruktionslehre, Hanser Verl.
- PAHL/BEITZ/FELDHUSEN/GROTE: Konstruktionslehre, Springer-Verl.
- VDI-Richtlinie 2221, 2222, 2225
- KOLLER: Konstruktionslehre für den Maschinenbau, Springer-Verl.
- EHRENSPIEL/KIEWERT/LINDEMANN: Kostengünstig Entwickeln und Konstruieren, Springer-Verl.
- LINDEMANN: Methodische Entwicklung technischer Produkte, Springer-Verl.
- BREIING/KNOSALA: Bewerten technischer Systeme, Springer-Verl.
- NEUDÖRFER: Konstruieren sicherheitsgerechter Produkte, Springer-Verl.

Requirements for attendance (informal)

Modules:

- [MV-FBK-15-M-4] Introduction to Manufacturing Technology (M, 5.0 LP) (/mhb/modules/MV-FBK-15-M-4/)
- [MV-MEGT-13-M-4] Mechanical Design I (M, 9.0 LP) (/mhb/modules/MV-MEGT-13-M-4/)
- [MV-MEGT-14-M-4] Mechanical Design II (M, 9.0 LP) (/mhb/modules/MV-MEGT-14-M-4/)
- [MV-VPE-B101-M-4] Integrated Design Engineering Education (M, 7.0 LP) (/mhb/modules/MV-VPE-B101-M-4/)

Requirements for attendance (formal)

None

References to Module / Module Number [MV-IMAD-30-M-4]

References to Module / Module Number [MV-KIMA-30-M-4]

Course of Study	Section	Choice/Obligation
[MV-82.103-SG] B.Sc. Mechanical Engineering (/mhb/FB-MV/cos-508/)	Ingenieurwissenschaftliche Grundlagen II (IWG II)	[P] Compulsory
[MV-82.814-SG] B.Sc. Mechanical Engineering with a minor in Economics (/mhb/FB-MV/cos-525/)	Ingenieurwissenschaftliche Grundlagen II	[P] Compulsory
[WIW-82.?-SG#2021] B.Sc. Business Administration and Engineering specialising in Mechanical Engineering 2021 [2021] (/mhb/FB-WIW/cos-690/)	Engineering	[WP] Compulsory Elective