

Module Handbook

TUK MODHB Homepage

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, bzw. am 13.01.2021 verabschiedet.

Ausnahmen:

- BEd. Lehramt Metalltechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Bachelor_Lehramt_Metalltechnik.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
- 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
- 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

Module MV-WKK-231-M-7

Materials selection in Mechanical Engineering (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MV-WKK-231-M-7	<i>Materials selection in Mechanical Engineering</i>	3.0 CP (90 h)

Basedata

CP, Effort	3.0 CP = 90 h
Position of the semester	1 Sem. in WiSe
Level	[7] Master (Advanced)
Language	[DE] German
Module Manager	Beck, Tilmann, Prof. Dr.-Ing. (PROF DEPT: MV)
Lecturers	Beck, Tilmann, Prof. Dr.-Ing. (PROF DEPT: MV) Liesegang, Moritz, M. Sc. (WMA DEPT: MV)
Area of study	[MV-WKK] Materials Science and Engineering
Reference course of study	[MV-88.B78-SG] M.Sc. Production Engineering in Mechanical Engineering
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V	MV-WKK-86166-K-7	P	-	PL1	3.0	WiSe

- About [MV-WKK-86166-K-7]: Title: "Materials selection in Mechanical Engineering"; Presence-Time: 28 h; Self-Study: 62 h

Examination achievement PL1

- Form of examination: **written or oral examination**
- Examination Frequency: each semester
- Examination number: 10166 ("Materials selection in Mechanical Engineering")

Written (90 minutes) or oral (25 - 35 minutes) examination.

Evaluation of grades

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

Contents

From [MV-WKK-86166-K-7] Materials selection in Mechanical Engineering:

A reasonable selection of suitable materials is essential for the success of a product. The enormous number of materials available still increases constantly due to research and development of new materials coupled to an increasing performance of every single material. Therefore, the process of materials selection is dynamic and has to be adapted to the current situation to ensure the success of products.

The main objectives of the lecture are:

- General aspects and motivation for materials selection
- An overview about the most important structural and functional materials
- Selected methods for materials selection
- Property maps and material indices

- Conflicts between requirements and material properties
- Influence of geometry and shape factors
- Hybrid materials and composites
- Industrial design and manufacturing
- Influence of operating temperatures
- Results of incorrect materials selection
- Selected examples for materials selection in practice

Competencies / intended learning achievements

From [MV-WKK-86166-K-7] Materials selection in Mechanical Engineering:

The following expertises will be promoted:

- Most important materials, classes of materials and manufacturing processes
- Criteria and requirements for a successful materials selection
- Preformation of materials selection for potential products
- Solutions for conflictual material requirements
- Combine materials selection and manufacturing process

Literature

From [MV-WKK-86166-K-7] Materials selection in Mechanical Engineering:

- M. F. Ashby: Materials Selection in Materials Design. 4rd edition, Elsevier Verlag, 2011
- M.F. Ashby, A. Wanner (Hrsg.) C. Fleck (Hrsg.): Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen. Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006
- M. Reuter: Methodik der Werkstoffauswahl – Der systematische Weg zum richtigen Material. Hanser Verlag, 2007
- J. Grosch: Werkstoffauswahl im Maschinenbau. Band 199, Kontakt und Studium: Werkstofftechnik, Expert Verlag, 1986
- K.G. Budinsky and M.K. Budinsky : Engineering Materials, Properties and Selection. 6th edition, Prentice Hall, London, UK, 1999
- M. Kutz: Handbook of Materials Selection. John Wiley & Sons, New York, USA, 2002

Requirements for attendance of the module (informal)

Modules:

- [MV-AWP-253-M-4] Materials Science I for Students of other faculties (M, 3.0 LP)
- [MV-AWP-254-M-4] Materials Science I for Students of other faculties (M, 3.0 LP)
- [MV-WKK-B100-M-4] Materials Science (M, 11.0 LP)

Requirements for attendance of the module (formal)

None

References to Module / Module Number [MV-WKK-231-M-7]

Course of Study	Section	Choice/Obligation
[MV-88.B73-SG] M.Sc. Materials Science and Engineering	[Compulsory Modules] Pflichtmodule	[P] Compulsory
[MV-88.?-SG#2022] M.Sc. Materialwissenschaften und Werkstofftechnik 2022 [2022]	[Compulsory Modules] Pflichtmodule	[P] Compulsory
Module-Pool	Name	
[MV-ALLG-2022-MPOOL-6]	Wahlpflichtmodule Master allgemein 2022	
[MV-ALL-MPOOL-6]	Wahlpflichtmodule allgemein	
[MV-EVT-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. EVT 2022	
[MV-EVT-MPOOL-6]	Wahlpflichtmodule Energie- und Verfahrenstechnik	
[MV-FT-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. Fahrzeugtechnik 2022	
[MV-FT-MPOOL-6]	Wahlpflichtmodule Fahrzeugtechnik	
[MV-PE-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. Produktentwicklung 2022	
[MV-PE-MPOOL-6]	Wahlpflichtmodule Produktentwicklung im Maschinenbau	