

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-LAF-M220-M-7

Concept and design of engines and powertrain systems (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MV-LAF-M220-M-7	<i>Concept and design of engines and powertrain systems</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	Günthner, Michael, Prof. Dr.-Ing. (PROF DEPT: MV) (/staff/313/)
Lecturers	Fuchs, Thorsten, Dr.-Ing. (WMA DEPT: MV) (/staff/257/) Günthner, Michael, Prof. Dr.-Ing. (PROF DEPT: MV) (/staff/313/)
Area of study	[MV-LAF] Vehicle Propulsion Systems
Reference course of study	[MV-88.235-SG] M.Sc. Vehicle Engineering (/mhb/FB-MV/cos-547/)
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V	MV-LAF-86321-K-7 (/mhb/courses/MV-LAF-86321-K-7/)	P	-	PL1	3.0	WiSe

- About **[MV-LAF-86321-K-7]**: Title: "Concept and design of engines and powertrain systems"; Presence-Time: 28 h; Self-Study: 62 h

Examination achievement PL1

- Form of examination: **written exam (Klausur) (60-90 Min.)**
- Examination Frequency: each semester
- Examination number: 10321 ("Concept and design of engines and powertrain systems")

Evaluation of grades

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

Contents

From **[MV-LAF-86321-K-7] Concept and design of engines and powertrain systems** (/mhb/courses/MV-LAF-86321-K-7/):

The lecture provides essential information on:

- theoretical basics
- crank drives
- valve trains
- intake and exhaust systems
- naturally aspirated engines and turbocharging
- engine process simulation
- the powertrain (conventional and hybrid)

Competencies / intended learning achievements

From **[MV-LAF-86321-K-7] Concept and design of engines and powertrain systems** (/mhb/courses/MV-LAF-86321-K-7/):

7/):

The students are able to

- gain a deeper understanding of engines and how they increase performance and efficiency (using sports cars/motorcycles and motorsport as examples).
- understand the decisive components of performance design.
- understand the correlations between the components and thus be able to improve them.
- evaluate the high demands caused by the loads in the engine.
- discuss the interrelationships of power and torque increase on the 4-stroke petrol engine.
- understand the various requirements in the design of an engine and the use and necessity of engine process simulation (excursus).
- name modern powertrains with their components, assess their suitability for vehicle concepts and, if necessary, make recommendations for optimization.

Literature

From [MV-LAF-86321-K-7] **Concept and design of engines and powertrain systems** (/mhb/courses/MV-LAF-86321-K-7/):

- Basshuysen: Handbuch Verbrennungsmotor, Springer Verlag
- Publications from technical journals

Requirements for attendance (informal)

Recommended prior knowledge: Basic knowledge of thermodynamics, basic knowledge of mechanics, internal combustion engines and/or vehicle propulsion systems.

Requirements for attendance (formal)

None

References to Module / Module Number [MV-LAF-M220-M-7]

Module-Pool	Name
[MV-ALL-MPOOL-6 (/mhb/modulepools/MV-ALL-MPOOL-6/)]	Wahlpflichtmodule allgemein
[MV-FT-MPOOL-6 (/mhb/modulepools/MV-FT-MPOOL-6/)]	Wahlpflichtmodule Fahrzeugtechnik