

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-FBK-M191-M-7

Optical, chemical and electrical manufacturing technologies (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MV-FBK-M191-M-7	<i>Optical, chemical and electrical manufacturing technologies</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	Kirsch, Benjamin, Dr.-Ing. (WMA DEPT: MV) (/staff/259/)
Lecturers	Kirsch, Benjamin, Dr.-Ing. (WMA DEPT: MV) (/staff/259/)
Area of study	[MV-FBK] Manufacturing Technology and Production Systems
Reference course of study	[MV-88.B78-SG] M.Sc. Production Engineering in Mechanical Engineering (/mhb/FB-MV/cos-578/)
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V	MV-FBK-86526-K-7	P	-	PL1	3.0	WiSe

- About **[MV-FBK-86526-K-7]**: Title: "Optical, chemical and electrical manufacturing technologies"; Presence-Time: 28 h; Self-Study: 62 h

Examination achievement PL1

- Form of examination: **written or oral examination**
- Examination Frequency: each semester
- Examination number: 10536 ("Optical, chemical and electrical manufacturing technologies")

Oral (30-45 min.) or written (90-120 min.) examination

Evaluation of grades

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

Contents

From **[MV-FBK-86526-K-7] Optical, chemical and electrical manufacturing technologies** (/mhb/courses/MV-FBK-86526-K-7/):

- Ablation, Electrical discharge machining (EDM), Electrochemical machining (ECM): Physical fundamentals, Influencing factors
- Additive Manufacturing: Physical fundamentals, Influencing factors, Process variants, Process chains, Product life cycle, Applications, Special features regarding the manufactured components
- Laser processing: Physical fundamentals, Influencing factors, Beam guidance and Interactions, Features of the manufacturing systems, Process variants of Laser processing
- Microstructure technology; Applications and Requirements, Substrates and materials, Lithography, Etching techniques, Three-dimensional microstructuring methods, Conventional processes in microstructure technology, Special features of production facilities, processes and applications.

Competencies / intended learning achievements

From [MV-FBK-86526-K-7] Optical, chemical and electrical manufacturing technologies (/mhb/courses/MV-FBK-86526-K-7/):

The students are able to

- describe the physical basics of important optical, chemical and electrical manufacturing processes
- characterize the factors influencing the process result variables of these manufacturing processes
- describe the differences with regard to the required machine peripherals, operating supplies and auxiliary materials
- select processes and tools for suitable machining with regard to materials and component geometries
- evaluate processes and tools with regard to their suitability for machining tasks and to identify potential for improvement of existing process chains

Literature

From [MV-FBK-86526-K-7] Optical, chemical and electrical manufacturing technologies (/mhb/courses/MV-FBK-86526-K-7/):

- Hilleringmann: Mikrosystemtechnik: Prozessschritte, Technologien, Anwendungen; Springer Verlag 2006
- Ehrfeld; Handbuch Mikrotechnik, Hanser Verlag 2002
- Gebhardt; Generative Fertigungsverfahren, Hanser Verlag 2007
- Klocke, Fertigungsverfahren 3 – Abtragen, Generieren und Lasermaterialbearbeitung, Springer Verlag 2007
- Qin: Micromanufacturing Engineering and Technology, Elsevier 2015
- Poprawe: Lasertechnik für die Fertigung, Springer Verlag 2005
- Ehmann: Micromanufacturing – International Research and Development, Springer Verlag 2007
- Gibson: Additive Manufacturing Technologies, Springer Verlag 2015

Requirements for attendance (informal)

None

Requirements for attendance (formal)

None

References to Module / Module Number [MV-FBK-M191-M-7]

Module-Pool	Name
[MV-ALL-MPOOL-6 (/mhb/modulepools/MV-ALL-MPOOL-6/)]	Wahlpflichtmodule allgemein
[MV-MBBWL-MPOOL-6 (/mhb/modulepools/MV-MBBWL-MPOOL-6/)]	Wahlpflichtmodule Maschinenbau mit Betriebswirtschaftslehre
[MV-PE-MPOOL-6 (/mhb/modulepools/MV-PE-MPOOL-6/)]	Wahlpflichtmodule Produktentwicklung im Maschinenbau
[MV-PT-MPOOL-6 (/mhb/modulepools/MV-PT-MPOOL-6/)]	Wahlpflichtmodule Produktionstechnik