

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

Course MV-WSKL-86571-K-4

Mechatronic Systems (3V+1U, 5.0 LP)

Course Type

SWS	Type	Course Form	CP (Effort)	Presence-Time / Self-Study
-	K		5.0 CP	94 h
3	V	Lecture		42 h
1	U	Lecture hall exercise class		14 h
(3V+1U)			5.0 CP	56 h 94 h

Basedata

SWS	3V+1U
CP, Effort	5.0 CP = 150 h
Position of the semester	1 Sem. in SuSe
Level	[4] Bachelor (Specialization)
Language	[DE] German
Lecturers	Ruskowski, Martin, Prof. Dr.-Ing. (PROF DEPT: MV)
Area of study	[MV-WSKL] Machine Tools and Control Systems
Additional informations	Informations about the course
Lifecycle-State	[NORM] Active

Contents

- Sensors (Acceleration, Force, Torque, Pressure, Temperature)
- Actuators (electromechanical actuators, motors, piezoelectric, pneumatic, and hydraulic actuators)
- Dynamic characteristics of sensors and actuators
- Signal processing (time-continuous, discrete, digital/analogue)
- Description and modelling of physical systems in mechatronics (mechanical, electrical, hydraulic, pneumatic, thermal systems, multi-body dynamic)
- Representation and transformation of physical systems in time domain, frequency domain and image domain (state space model, Laplace and Fourier transformation)
- Control systems (stability, state feedback, control design, filtering, observer, system identification)

Competencies / intended learning achievements

The students will be able to

- describe the functionality of sensors and actuators.
- model a mechatronic system.
- apply concepts of control techniques to mechatronic systems.
- deploy computer programs to simulate models and develop control systems.

Literature

- Isermann, R.: "Mechatronische Systeme: Grundlagen". Springer, 1999.
- Bishop, R.H. (Ed.): "Mechatronics: An Introduction". Taylor and Francis, 2006.

Materials

For further information and course materials please consider the corresponding OLAT-course.

Requirements for attendance (informal)

Prior knowledge from one of these modules:

Modules:

- [MV-CPE-M209-M-4] Dynamics of Structures (M, 5.0 LP)
- [MV-MEC-22-M-4] Dynamics of Machines (M, 5.0 LP)

Requirements for attendance (formal)

None

References to Course [MV-WSKL-86571-K-4]

Module	Name	Context	
[MV-WSKL-M208-M-4]	Mechatronic Systems	P: Obligatory	3V+1U, 5.0 LP