

## 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](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](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-LTD-M187-M-7

Data evaluation and design of experiments (M, 3.0 LP)

### Module Identification

Module Number	Module Name	CP (Effort)
MV-LTD-M187-M-7	<i>Data evaluation and design of experiments</i>	3.0 CP (90 h)

### Basedata

CP, Effort	3.0 CP = 90 h
Position of the semester	1 Sem. in SuSe
Level	[7] Master (Advanced)
Language	[DE] German
Module Manager	Hasse, Hans, Prof. Dr.-Ing. (PROF   DEPT: MV)
Lecturers	Bortz, Michael, Dr.-Ing. habil. (EXT   DEPT: MV)
Area of study	[MV-LTD] Engineering Thermodynamics
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-LTD-86081-K-7	P	TESTAT	PL1	3.0	SuSe

- About [MV-LTD-86081-K-7]: Title: "Data evaluation and design of experiments"; Presence-Time: 28 h; Self-Study: 62 h
- About [MV-LTD-86081-K-7]: The study achievement "[TESTAT] tests / audited elaborations" must be obtained.
  - It is a prerequisite for the examination for PL1.

## Examination achievement PL1

- Form of examination: **oral examination (20-30 Min.)**
- Examination Frequency: each semester
- Examination number: 10196 ("Data evaluation and design of experiments")

## Evaluation of grades

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

### Contents

From [MV-LTD-86081-K-7] Data evaluation and design of experiments:

- Basics of statistics:
  - Hypothesis testing
  - Analysis of variance
- Data analysis:
  - Correlation analysis
  - Principal Component Analysis (PCA)
- Data-based modeling:
  - linear regression
  - partial least squares
  - non-linear regression
  - model evaluation and discrimination

- Design of experiments:
  - factorial experiments
  - model-based experimental design
- independent application of theory in practical computer exercises

## Competencies / intended learning achievements

From [MV-LTD-86081-K-7] Data evaluation and design of experiments:

### 1. Lecture

The students are able to

- describe basic methods of statistics, parameter estimation and experimental design
- estimate parameters
- evaluate models using statistical methods

### 2. Exercise

The students are able to

- apply the methods discussed in the lecture independently in small groups
- estimate parameters for process engineering models
- evaluate the developed models by statistical means
- create statistical experimental designs and identify optimal experimental conditions

## Literature

From [MV-LTD-86081-K-7] Data evaluation and design of experiments:

- D. C. Montgomery, Design and Analysis of Experiments, Wiley
- A. Rasmuson et al., Mathematical Modeling in Chemical Engineering, Cambridge University Press
- Peter Goos, Bradley Jones; Optimal Design of Experiments: A Case Study Approach

## Requirements for attendance of the module (informal)

Previous knowledge of higher mathematics

## Requirements for attendance of the module (formal)

None

## References to Module / Module Number [MV-LTD-M187-M-7]

Course of Study	Section	Choice/Obligation
[MV-88.A29-SG] M.Sc. Biological and Chemical Engineering	[Compulsory Modules] Studienschwerpunkt II	[WP] Compulsory Elective
Module-Pool	Name	
[MV-ALLG-2022-MPOOL-6]	Wahlpflichtmodule Master allgemein 2022	
[MV-ALL-MPOOL-6]	Wahlpflichtmodule allgemein	
[MV-BioVT-MPOOL-6]	Wahlpflichtmodule Bioverfahrenstechnik	
[MV-CE-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. Computational Engineering 2022	
[MV-CE-MPOOL-6]	Wahlpflichtmodule Computational Engineering	
[MV-EVT-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. EVT 2022	
[MV-EVT-MPOOL-6]	Wahlpflichtmodule Energie- und Verfahrenstechnik	
[MV-PE-2022-MPOOL-6]	Wahlpflichtmodule M.Sc. Produktentwicklung 2022	
[MV-PE-MPOOL-6]	Wahlpflichtmodule Produktentwicklung im Maschinenbau	