

## 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) ([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) ([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) ([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) ([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) ([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) ([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-SAM-31-M-4

Turbomachinery I (M, 4.0 LP)

### Module Identification

Module Number	Module Name	CP (Effort)
MV-SAM-31-M-4	<i>Turbomachinery I</i>	4.0 CP (120 h)

### Basedata

CP, Effort	4.0 CP = 120 h
Position of the semester	1 Sem. in WiSe
Level	[4] Bachelor (Specialization)
Language	[DE] German
Module Manager	Roclowski, Harald, Dr.-Ing. (WMA   DEPT: MV) (/staff/268/)
Lecturers	Roclowski, Harald, Dr.-Ing. (WMA   DEPT: MV) (/staff/268/)
Area of study	[MV-SAM] Fluid Mechanics and Turbomachinery
Reference course of study	[MV-82.B10-SG] B.Sc. Energy and Process Engineering (/mhb/FB-MV/cos-528/)
Lifecycle-State	[NORM] Active

## Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V+2U	<a href="/mhb/courses/MV-SAM-86356-K-4/">MV-SAM-86356-K-4</a>	P	-	PL1	4.0	WiSe

- About **[MV-SAM-86356-K-4]**: Title: "Turbomachinery I"; Presence-Time: 56 h; Self-Study: 64 h

## Examination achievement PL1

- Form of examination: **written exam (Klausur) (90 Min.)**
- Examination Frequency: each semester
- Examination number: 10356 ("Fluid Flow Machines I")

## Evaluation of grades

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

### Contents

From **[MV-SAM-86356-K-4] Turbomachinery I** (/mhb/courses/MV-SAM-86356-K-4/):

- Introduction to design and work principle of axial, diagonal and radial turbomachinery
- Euler equation of turbomachinery
- Power and work machines
- Thermal and hydraulic turbomachinery
- Application of the conservation principles of thermodynamics on turbomachinery
- Application examples of turbomachinery in thermodynamic cycles
- 1-D theory of turbomachinery
- Characteristic numbers and maps
- Affinity laws
- Euler differential equation of relative flow

### Competencies / intended learning achievements

From **[MV-SAM-86356-K-4] Turbomachinery I** (/mhb/courses/MV-SAM-86356-K-4/):

## 1. Lecture

The students will be able:

- to describe the design and work principles of turbomachinery
- to explain the principle of energy conversion in turbomachinery
- to apply the 1D theory of turbomachinery to different machine types
- to work with characteristic numbers and maps
- to analyze flows in turbomachinery

## 2. Tutorial

The students will be able:

- to calculate the energy conversion in turbomachinery
- to apply the conservation equations of thermodynamics to turbomachinery
- to sketch and calculate the velocity components for turbomachinery
- to calculate the characteristic numbers and maps of turbomachinery

## Literature

From [MV-SAM-86356-K-4] Turbomachinery I (/mhb/courses/MV-SAM-86356-K-4/):

- C. Pfleiderer, H. Petermann: Strömungsmaschinen, Springer Verlag, Berlin, 1991
- P. Hill, C. Peterson: Mechanics and Thermodynamics Propulsion, Addison-Wesley Publishing Company, New York, 1992

## Requirements for attendance (informal)

### Modules:

- [MV-SAM-24-M-4] Fluid Mechanics I (M, 5.0 LP) (/mhb/modules/MV-SAM-24-M-4/)
- [MV-TD-18-M-4] Thermodynamics I (M, 5.0 LP) (/mhb/modules/MV-TD-18-M-4/)

## Requirements for attendance (formal)

None

## References to Module / Module Number [MV-SAM-31-M-4]

Course of Study	Section	Choice/Obligation
[MV-82.103-SG] B.Sc. Mechanical Engineering (/mhb/FB-MV/cos-508/)	Product Development in Mechanical Engineering (if chosen)	[P] Compulsory
[MV-82.103-SG] B.Sc. Mechanical Engineering (/mhb/FB-MV/cos-508/)	KF5: Computational Engineering (if chosen)	[P] Compulsory
[MV-82.B10-SG] B.Sc. Energy and Process Engineering (/mhb/FB-MV/cos-528/)	Ingenieurwissenschaftliche Grundlagen II	[P] Compulsory
[WIW-82.?-SG#2021] B.Sc. Business Administration and Engineering specialising in Energy and Process Engineering [2021] (/mhb/FB-WIW/cos-689/)	Energy and Process Engineering	[WP] Compulsory Elective
Module-Pool	Name	
[MV-BCI-BSc-MV-MPOOL-4 (/mhb/modulepools/MV-BCI-BSc-MV-MPOOL-4/)]	Wahlpflichtmodule MV für Bachelor BCI	