

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-MFM-86750-K-7

Physicochemical Hydrodynamics (3V, 4.0 LP)

Course Type

SWS	Type	Course Form	CP (Effort)	Presence-Time / Self-Study
3	V	Lecture with integrated exercises	4.0 CP	42 h 78 h
(3V)			4.0 CP	42 h 78 h

Basedata

SWS	3V
CP, Effort	4.0 CP = 120 h
Position of the semester	1 Sem. in SuSe
Level	[7] Master (Advanced)
Language	[DE] German
Lecturers	Schönecker, Clarissa, Jun.-Prof. Dr.-Ing. (PROF DEPT: MV)
Area of study	[MV-MFM] Micro Fluid Mechanics
Additional informations	Informations about the course
Lifecycle-State	[NORM] Active

Contents

Physicochemical Hydrodynamics is the science of fluid dynamics under physical, chemical and biochemical influences. These influences play an important role in many systems in process engineering or biology. Examples are coating, printing or cleaning processes or the flow of components in natural environments like cells.

In this lecture, it will be shown from a fluid dynamics perspective, which additional influences on hydrodynamics can occur. It will be described how these influences can be modelled and examples for applications will be discussed.

Topics are:

- interfacial tension, wetting and capillarity
- multi-phase flows and diffusion
- electrokinetic flows
- applications like coating flows and colloid stability

Competencies / intended learning achievements

At the end of the course, the students shall be able

- to describe and to evaluate the influence of interfaces on flows
- to estimate the importance of influences on flows
- to know about the mechanisms of friction and drag in flows and to evaluate them
- to explain typical calculation methods
- to explain effects that occur due to interfaces

Literature

Probstein: Physicochemical Hydrodynamics - An Introduction, Wiley

Materials

Blackboard, projector, slides. For further information and course materials please consider the corresponding OLAT-course.

Requirements for attendance (informal)

Recommended:

Modules:

- [MV-SAM-101-M-4] Fluid Mechanics II (M, 5.0 LP)
- [MV-SAM-24-M-4] Fluid Mechanics I (M, 5.0 LP)

Requirements for attendance (formal)

None

References to Course [MV-MFM-86750-K-7]

Module	Name	Context	
[MV-MFM-M197-M-7]	Physicochemical Hydrodynamics	P: Obligatory	3V, 4.0 LP