FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Modulbezeichnung:	**Interface Engineering and Particle Technology (IEPT)** (Interface Engineering and Particle Technology)	**5 ECTS**
Modulverantwortliche/r:	Robin N. Klupp Taylor	
Lehrende:	Robin N. Klupp Taylor	

Startsemester: SS 2022	Dauer: 1 Semester	Turnus: jährlich (SS)
Präsenzzeit: 60 Std.	Eigenstudium: 90 Std.	Sprache: Englisch

Lehrveranstaltungen:

Interface Engineering and Particle Technology (SS 2022, Vorlesung, 2 SWS, Robin N. Klupp Taylor)
Exercise Interface Engineering and Particle Technology (SS 2022, Übung, 3 SWS, Robin N. Klupp Taylor)

Empfohlene Voraussetzungen:

To succeed in this course, students will need to apply acquired knowledge from e.g. physics, physical chemistry and mathematics.

Inhalt:

This module provides students with an overview of the following key concepts and practical aspects of the fields of interfacial engineering and particle technology:

- Molecular interactions: Adsorption and adhesion
- Particle nucleation and growth
- Particle stabilization
- Particle size and shape.
- Particles in motion
- Particle size distributions
- Unit operations: separations, mixing, comminution
- Packed and fluidized beds

The associated exercises and homework cover all topics and allow students to develop their understanding independently with follow-up support from the course tutors.

Lernziele und Kompetenzen:

Students who successfully participate in this module can

- understand the relevance of interfaces in the natural and artificial world.
- master the fundamentals of the subject and apply them to the specific case of wetting, particle nucleation, growth and stabilization
- analyse interfacial-dependent processes in their connection with engineering challenges and develop solutions.
- define the societal relevance of particle technology
- give examples of unit operations of particle technology
- differentiate between the various approaches for defining particle size and shape
- analyze the motion of particles according to physical and engineering principles
- analyze particle size distributions, distinguish between accepted norms for their presentation, and apply them for the analysis of separation equipment
- describe the structure of packings and bulk materials and the perfusion of those
- describe the fundamentals of the processes of separation, mixing, comminution and fluidization
- apply their acquired knowledge and skills in the additional exercises and tutorials in order to solve independently problems from interfacial and mechanical processes engineering

Literatur:

- Peukert, W: Script “Particle Technology 1"
- Rumpf, H.: Particle Technology
- Stiess: Mechanische Verfahrenstechnik
- Butt, H.-J., Graf, K.; Kappl, M.; Physics and Chemistry of Interfaces, Wiley-VCH, Berlin 2013, ISBN 978-3-527-41216-7

- Israelachvili J.; Intermolecular and Surface Forces, Rev. 3rd Edition, Academic Press, ISBN: 9780123919274
- Stokes, Robert J. / Evans, D. Fennell; Fundamentals of Interfacial Engineering, 1997; John Wiley & Sons; ISBN 978-0-471-18647-2
- Adamson, A., Physical chemistry of surfaces, Wiley-VCH, 1997
- Hunter, R. J., Introduction to modern colloid science, Oxford University Press, 1993
- Lyklema, J., Fundamentals of interface and colloid science, Elsevier, 2005
- Coulson and Richardson's Chemical Engineering Volume 2 - Particle Technology and Separation Processes (5th Edition) 2002
- Rhodes, Martin Introduction to Particle Technology, Weinheim, Wiley-VCH, 2008
- Svarovsky, Ladislav. Solid-liquid Separation, Oxford, Butterworth-Heinemann, 2000
- Schubert: Handbuch der Mechanischen Verfahrenstechnik

Studien-/Prüfungsleistungen:

Interface engineering and particle technology (Prüfungsnummer: 27731)
Prüfungsleistung, Klausur, Dauer (in Minuten): 90
Anteil an der Berechnung der Modulnote: 100%
weitere Erläuterungen:
The grading procedure is based on 100 % module examination
Prüfungssprache: Englisch

Erstablegung: SS 2022, 1. Wdh.: WS 2022/2023
1. Prüfer: Robin N. Klupp Taylor
