Modulbezeichnung: **Chemical Reaction Engineering (CRE)** **5 ECTS**
(Chemical Reaction Engineering)

Modulverantwortliche/r: Marco Haumann
Lehrende: Marco Haumann

Startsemester: WS 2020/2021	Dauer: 1 Semester	Turnus: jährlich (WS)
Präsenzzeit: 30 Std.	Eigenstudium: 120 Std.	Sprache: Englisch

Lehrveranstaltungen:
Chemical Reaction Engineering (WS 2020/2021, Vorlesung, 2 SWS, Marco Haumann et al.)

Empfohlene Voraussetzungen:
To succeed in this course students will need to apply earlier acquired knowledge from e.g. physical chemistry, mathematics. A solid background in mathematics is required, since differential equations and integrals form the basis for the description of the chemical processes and their kinetics.
Understanding of kinetics to describe the time dependent concentration changes in chemical reactions should be familiar from physical chemistry classes. Basic knowledge in thermodynamics and general chemistry is beneficial.

Inhalt:
- fundamental parameters
- micro-kinetics
- heterogeneous catalysis - reaction processes on surfaces
- macro-kinetics - inner and outer mass transfer:
- macro Kinetics - non isothermal conditions
- types of chemical reactors
- reactor modelling - mass and heat
- reactors - stable operation points

Lernziele und Kompetenzen:
Students who participate in this course will become familiar with basic concepts of chemical reaction engineering. Students who successfully participate in this module can
- describe complex reactions by kinetic rate expressions
- analyze reactions on solid surfaces of heterogeneous catalysts
- describe and quantify the interplay between reaction kinetics and mass transport
- describe and quantify mass and heat balances in catalyst particles
- classify chemical reactors based on reacting phases or mode of operation
- balance mass and heat flows in ideal reactors
- find stable and safe operation points for reactors

Literatur:
- Jess and P. Wasserscheid, Chemical Technology, Wiley-VHC, Weinheim.
- O. Levenspiel, Chemical Reaction Engineering. John Wiley.

Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:
Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:
[1] **Advanced Materials and Processes (Master of Science)**
(Po-Vers. 2019w | TechFak | Advanced Materials and Processes (Master of Science) | Gesamtkonto | Grundlagenfächer | Chemical Reaction Engineering)

Studien-/Prüfungsleistungen:
Chemical Reaction Engineering (Prüfungsnummer: 1702)
(englische Bezeichnung: Chemical Reaction Engineering)
Studienleistung, Klausur, Dauer (in Minuten): 90
weitere Erläuterungen:
According to the corona regulations, an alternative mode of assessment could be "oral exam over 30

minutes" or "research paper" Gemäß Corona-Satzung wird als alternative Prüfungsform festgelegt: mündliche Prüfung mit 30 Minuten Dauer. Weitere Alternative: Hausarbeit
Prüfungssprache: Englisch

Erstablegung: WS 2020/2021, 1. Wdh.: SS 2021
1. Prüfer: Marco Haumann
