

Course title:	Fundamentals of chemical reaction engineering
Institute/Division:	FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY
Number of contact hours:	30 hours (15 h lectures and 15 h exercises)
Course duration:	1 semester (6 th semester of regular I cycle studies - spring)
ETCS credits:	2

Course description:

Lectures: The course covers basic topics on chemical reaction and chemical reactor engineering such as: stoichiometry; extent, yield and selectivity of chemical reaction; chemical equilibrium; kinetics of chemical reactions and rate laws; influence of temperature on the rate equation; kinetics of multiple chemical reactions; introduction to chemical reactor design; homogeneous chemical reactions in ideal isothermal reactors.

Exercises: The exercise classes will be focused on solving the problems directly related to the lecture topics, including calculation of measurement variables of chemical reactions, determination of rate equations, formulation of mass balances for isothermal ideal reactors.

Education effects :

- knowledge: understanding fundamentals of chemical reaction and chemical reactor engineering; knowledge concerning kinetics of single and multiple chemical reactions; understanding of the behavior of closed and open systems with chemical reaction; knowledge concerning ideal chemical reactors for homogeneous processes.
- skills: ability to characterize the extent of a single and multiple chemical reaction and other variables characterizing chemical reaction; ability to interpret the kinetic data and determine the rate equations using various techniques; ability to determine basic design parameters of ideal homogeneous chemical reactors.
- social: student is able to work independently and in the group when solving practical problems related to fundamentals of chemical reaction engineering.

Literature:

- [1] H. S. Fogler, *Elements of chemical reaction engineering*, Pearson, 2014.
- [2] O. Levenspiel, *Chemical reaction engineering*, John Wiley & Sons, 1999.
- [3] M. Schmal, *Chemical reaction engineering. Essential, exercises and examples*, CRC Press, 2014.

Assessment method:	Midterm test (problem solving), final test
Prerequisites:	Basic courses of mathematics and chemical engineering.
Primary target group:	Students from all specialties

Lecturer:	dr hab. inż. K.Bizon
Contact person:	dr hab. inż. K. Bizon (kbizon@chemia.pk.edu.pl)

Remarks:	Regular course
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