COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering of chemical reactors [S1IChiP1>IRC]

Course

Field of study
Chemical and Process Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
45

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

5,00

Coordinators

dr hab. inż. Krzysztof Alejski prof. PP
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Lecturers

Prerequisites

Student should have fundamental knowledge in the range of thermodynamics and chemical kinetics and also should have the ability to use differential calculus. The student has the ability to use a differential calculus. Student has the ability to acquire information from specified sources.

Course objective

Obtaining knowledge and skills in material and energy balancing of reactor processes, as well as kinetic calculation and selection of chemical reactors for various reaction systems.

Course-related learning outcomes

Knowledge:
1. has structured and theoretically founded knowledge about the classification of reactors and their use to conduct reaction processes for various purposes. (k_w12, k_w13)
2. has knowledge of theoretical models used in reactor calculations. (k_w10, k_w12)
3. has knowledge about the conditions for choosing the type of reactor depending on the type of process. (k_w15, k_w18)

Skills:
1. has the ability to conduct balance calculations of reaction systems. (k_u16)
2. he can choose the type and design reactor for chemical production. (k_u16, k_u17)

Social competences:
1. understands the need to constantly update knowledge. (k_k1, k_k2)
2. has the ability to work in a team. (k_k4)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Knowledge acquired during the lecture and skills are verified during the written exam. Passing threshold: 50% of points. Knowledge, skills and competences within project classes are verified on the basis of projects made in two-man teams.

Programme content

1. Classification of reactors.
2. Special reactors.
3. Material and energy balance of flow reactor.
4. Theoretical models of reactors.
5. Design of reactors.
6. Criteria for choosing the reactor type.

Teaching methods

Lecture: presentation with discussion on the board.
Project: implementation of the reactor design in two-man teams.
Laboratory classes: laboratory tests

Bibliography

Basic
1. J. Szarawara, J. Piotrowski, Podstawy teoretyczne technologii chemicznej, Warszawa, PWN 2010.
2. Podstawy technologii chemicznej i inżynierii reaktorów, pod red. M. Wiśniewskiego i K. Alejskiego, skrypt, Wydawnictwo Politechniki Poznańskiej, Poznań 20017.
3. A. Burghardt, G. Bartelmus, Inżynieria reaktorów chemicznych, PWN Warszawa 2001.
4. Fogler H. Scott, Elements of Chemical Reaction Engineering, Prentice Hall 2016.
Additional
1. P.W. Atkins, Chemia fizyczna, Wyd. Nauk. PWN, Warszawa 2003.
2. J. Szarawara, Termodynamika chemiczna stosowana, WNT 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	5,00
Classes requiring direct contact with the teacher	90	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	60	2,00