COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering of chemical reactors [S2TCh2>IR]

Course

Field of study
Chemical Technology

Year/Semester
1/1

Area of study (specialization)
Applied Electrochemistry

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Fundamentals of chemical reaction engineering

Course objective

Obtaining knowledge and skills in the calculation of real flow reactors, heterogeneous reactors and bioreactors.

Course-related learning outcomes

Knowledge:
1. Has structured and theoretically founded knowledge of advanced chemical reactor models. (K_W03, K_W04)
2. Has knowledge of the phenomena occurring in heterogeneous reactors and bioreactors. (K_W04, K_W11)

Skills:
1. Has the ability to select an advanced reactor or bioreactor model for a specific proces. (K_U09, K_U10)

2. Is able to design a real, heterogeneous reactor or bioreactor. (k_U01, K_U09)

Social competences:
1. Is aware of the need for lifelong learning and professional development. (K_K01)
2. Adheres to all teamwork rules; is aware of responsibility
for joint ventures and achievements in professional work.(K_K04)

Methods for verifying learning outcomes and assessment criteria

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

Issues in the field of calculation of real flow reactors, heterogeneous reactors and bioreactors.

Course topics

1. Characteristics of real reactors.
2. Functions of the distribution of residence time in reactors.
3. Calculation of the conversion in real reactors.
4. Kinetics of heterogeneous reactions.
5. Calculation of heterogeneous reactors.
6. Bioreactors.

Teaching methods

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

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. Fogler H. Scott, Elements of Chemical Reaction Engineering, Prentice Hall 2016.

Additional:
1. A. Burghardt, G. Bartelmus, Inżynieria reaktorów chemicznych, PWN Warszawa 2001.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	34	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	16	0,50