



Subject card

Subject name and code	Chemical reactors engineering, PG_00048874						
Field of study	Engineering and Technologies of Energy Carriers						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to practical vocational preparation		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			3.0		
Learning profile	practical profile	Assessment form			exam		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Gębicki					
	Teachers	dr hab. inż. Jacek Gębicki dr inż. Bartosz Szulczyński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	15.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study		SUM
	Number of study hours	45	10.0		20.0		75
Subject objectives	Presentation of topics related to possible configurations and selection of industrial reaction systems as well as a methods of describing a phenomena occurring in these systems and the necessary methodology for performing design calculations.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U08	The student is able to design the basic technological process taking into account the type of the reactor			[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	K7_U06	The student is able to estimate the economic cost of simple research problems			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	K7_U05	The student is able to apply the systems approach to simple research problems			[SU2] Assessment of ability to analyse information		
	K7_W13	The student is able to perform calculations with the knowledge of basic knowledge of basic sciences in the design of real and ideal reactors			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	K7_U07	The student is able to critically analyze technical problems in the design of reactors			[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
Subject contents	Issues regarding the calculation of reaction systems in relation to the law of conservation of mass and energy, changes in state parameters. Ways to maximize the efficiency of chemical processes based on thermodynamic characteristics of the process. The problems of selection of the optimal reaction system and its parameters. Methods of controlling and describing the course of chemical processes. Complex reaction systems and methods of their design and optimization. Ways to intensify chemical processes.						
Prerequisites and co-requisites	Basic knowledge of physical, organic and inorganic chemistry. Knowledge of issues of chemical engineering and chemical technology.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lecture	60.0%	50.0%
	exercises	60.0%	25.0%
	project	60.0%	25.0%
Recommended reading	Basic literature	<p>C.G. Hill, T.W. Root: Introduction to chemical engineering kinetics & reactors design 2nd ed., JohnWiley & Sons, Inc. 2014.</p> <p>G.F. Froment, K.B. Bischoff, J. de Wilde: Chemical reactor analysis and design, JohnWiley & Sons, Inc. 2011.</p> <p>U. Mann, Principles of chemical reactor analysis and design, New tools for industrial chemical reactor operations 2nd ed., JohnWiley & Sons, Inc. 2009.</p> <p>W.L. Luyben, Chemical reactor design and control, JohnWiley & Sons, Inc. 2007.</p>	
	Supplementary literature	Scientific publications and patents.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Calculations of conversion, efficiency of chemical reaction. Reaction system design.		
Work placement	Not applicable		