



Subject card

Subject name and code	Separation Techniques in Industry , PG_00048869						
Field of study	Engineering and Technologies of Energy Carriers						
Date of commencement of studies	February 2024		Academic year of realisation of subject			2024/2025	
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	1		Language of instruction			Polish	
Semester of study	2		ECTS credits			5.0	
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. Donata Konopacka-Łyskawa				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	15.0	0.0	75
	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	75		10.0		40.0	125
Subject objectives	The aim of the course is to present issues related to classic and modern separation techniques used in industry and to familiarize students with and organize their knowledge regarding processes and techniques that are used to separate components of one- and two-phase mixtures in the form of gas, vapor, true and colloidal solutions, suspensions.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	K7_U01		is able to plan and carry out experiments in the separation of mixtures, calculate the efficiency of mixture separation, interpret the obtained results and formulate conclusions regarding the effectiveness of the separation method used.			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment	
	K7_U04		is able to assess the usefulness and possibilities of using unit operations and processes for the separation of gas/liquid/solid mixtures.			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment	
	K7_W12		identifies processes and unit operations used to separate mixtures and analyzes in-depth the phenomena that determine the course of the mixture separation process.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge	
	K7_W13		knows methods of calculation of selected mixture separation techniques and methods of intensifying processes used to separate mixture components.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge	

Subject contents	Fundamentals, design principles and practical aspects of the following operations and separation processes/ techniques: physical and chemical absorption, countercurrent absorption, absorption batteries, multi-component absorption, desorption, distillation, condensation, continuous rectification of binary and multi-component mixtures, liquid-liquid and solid extraction solid-liquid, filtration and sedimentation centrifuges, separation in a magnetic field, separation in an electric field, integration of separation processes.		
Prerequisites and co-requisites	Knowledge in the field of chemistry (physical, organic, inorganic) and physics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	20.0%
	Written exam.	60.0%	60.0%
	Laboratory	60.0%	20.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> J. D. Seader, E. J. Henley, D. K. Roper, Separation process principles. Chemical and Biochemical Operations. 3rd Ed., Wiley, 2011 I. D. Wilson, E. R. Adlard, M. Cooke, C. F. Poole, Encyclopedia of Separation Science, Wiley 2000. 	
	Supplementary literature	Scientific publications on subject matter.	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	1. Present the principle of dedusting by gravity, inertia, in the field of centrifugal forces and discuss ways to increase the efficiency of dedusting using them. 2. Explain what a triboelectric series is. Using the triboelectric series, discuss what polymer mixtures can be separated effectively. 3. Draw a diagram of a rectification column with side exhaust. Write the balance of the top of the column. Discuss how the amount of side draft received affects the composition of the distillate. 4. Explain the principle of determining theoretical plates in an absorption column used for multi-component absorption. What does the term key ingredient of a mixture mean?		
Work placement	Not applicable		