



Subject card

Subject name and code	Separation Techniques in Industry , PG_00066046						
Field of study	Engineering and Technologies of Energy Carriers						
Date of commencement of studies	February 2027		Academic year of realisation of subject		2027/2028		
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		4.0		
Learning profile	practical profile		Assessment form		exam		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Donata Konopacka-Łyskawa				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	30.0	15.0	0.0	65
	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	65		10.0		25.0	100
Subject objectives	The aim of the course is to familiarize students with and organize knowledge about the processes and techniques used to separate components of single- and two-phase mixtures in the form of gases, vapours, specific solutions, colloidal solutions, suspensions, and to present the possibilities of using various methods for purifying and isolating chemical substances, as well as to develop skills in the field of separating mixtures using selected methods.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W05] recognizes and describes phenomena in the field of physics and chemistry, including elements of chemical engineering necessary to predict the course of a technological process.		recognizes and describes methods for separating single- and multi-phase mixtures used in energy raw material processing technologies		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K7_U04] prepares a critical analysis of existing technical solutions and is able to propose their improvements (improvements).		is able to critically evaluate methods of separating mixtures and propose changes to the separation parameters that will allow for the separation, purification or isolation of the desired component(s)		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K7_U02] is able to plan and conduct experiments, interpret the obtained results and draw conclusions		is able to plan and conduct experiments for separating mixtures using selected methods, interpret the obtained results and draw conclusions regarding the efficiency of separating a given mixture		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
Subject contents	Course content – lecture 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, intensification 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%	48.0%
	Laboratory	60.0%	20.0%
	Lecture presentation	60.0%	12.0%
Recommended reading	Basic literature	1. J. D. Seader, E. J. Henley, D. K. Roper, Separation proces principles. Chemical and Biochemical Operations. 3rd Ed., Wiley, 2011 2. 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		
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?		
Practical activites within the subject	Not applicable		

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