GDAŃSK UNIVERSITY OF TECHNOLOGY

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 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	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	dr inż. Iwona Hołowacz dr hab. inż. Donata Konopacka-Łyskawa dr inż. Edyta Słupek	

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_W13	knows methods of calculation of selected mixture separation techniques and methods of intensifying processes used to separate mixture components.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
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.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
K7_U04	is able to assess the usefulness and possibilities of using unit operations and processes for the separation of gas/liquid/solid mixtures.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
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.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools

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
Laboratory	60.0%	20.0%
Written exam.	60.0%	60.0%
Project	60.0%	20.0%

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	Adresy na platformie eNauczanie: Techniki rozdzielania w przemyśle - laboratorium - Moodle ID: 34292 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34292

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