GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Separation Techniques in Industry , PG_00066046		
Field of study	Techniki rozdzielania w przemyśle		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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_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	[SU1] Ocena realizacji zadania [SU2] Ocena umiejętności analizy informacji [SU4] Ocena umiejętności korzystania z metod i narzędzi
[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)	[SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu
[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	[SW1] Ocena wiedzy faktograficznej [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym

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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge in the field of chemistry (physical, organic, inorganic) and physics.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture presentation</td><td>60.0%</td><td>12.0%</td></tr>
<tr><td>Laboratory</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>Written exam.</td><td>60.0%</td><td>48.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">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.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Scientific publications on subject matter.</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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?</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.