GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00037573					
Field of study	Green Technologies					
Date of commencement of studies	October 2020		Academic year of realisation of subject	2022/2023		
Education level	first-cycle studies		Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery	at the university		
Year of study	3		Language of instruction	English		
Semester of study	5		ECTS credits	3.0		
Learning profile	general academic profile		Assessment form	assessment		
Conducting unit	Department of Colloid and Lipid Science -> Faculty of Chemistry					
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Christian Jungnickel				
	Teachers	dr hab. Christian Jungnickel				

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	45.0	0.0	45
	E-learning hours included: 0.0						
	Additional information: In-person classes, with didactic material available from https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26626						

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	2.0	28.0	75

Subject objectives	Understanding of computer aided design, including computer aided technical drawings, and chemical processes

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W04] is aware of the importance of environmental protection and has a basic knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors, has a basic knowledge of knowledge of the principles of sustainable development as well as national and European environmental management conditions.	Understanding process conditions, the student will learn to optimize various processes to minimize their environmental impact.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U03] is able to use information and communication technologies relevant to the common tasks of engineering, is able to use known methods and mathematical-physical models to describe and explain phenomena and chemical processes	Learning to use CAD software the student will be able solve engineering tasks	[SU1] Assessment of task fulfilment
	[K6_U04] capable of formulating and solving design tasks in the field of environmental technology to recognize their non-technical aspects, including environmental, economic and legal. Is capable of applying the principles of occupational health and safety. Is able to make initial assessment of engineering solutions and actions	Understanding chemical process, and simulating them, the student will be able to predict outcomes.	[SU2] Assessment of ability to analyse information

Subject contents	Computer simulation, modeling and control of environmental quality. Analysis of flow sheets with regard to environmental pollution and pollution prevention. Basic information about AutoCAD, application of AutoCAD in engineering drawing. Schematic and Technological Diagrams, Sankey Material and Energetical Plot for Chemical Process and Environmental Processes. Basic information about ChemCAD,Overview of the most important ChemCAD windows. File management in ChemCAD. Starting a new job, selecting engineering units, drawing the flowsheet, selecting a components, selecting thermodynamic options, defining the feed streams. Inputting equipment parameters: specifying the first heat exchanger, specifying the second heat exchanger, specifying the flash drum, specifying the valve. Batch operating units: batch distillation, defining the operating step, runtime displays, running the simulation, reviewing the results interactively, plotting the results, generating a full report. Construction of flow sheets and diagrams using AutoCAD and ChemCAD with respect to possibilities of air, water, soil pollution and waste generation.

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	50.0%	100.0%

Recommended reading	Basic literature	• Khan, I. U. (2011). CHEMCAD as a tool when teaching Chemical Engineering.
	Supplementary literature	• Martín, M. M. (2014). *Introduction to software for chemical engineers*. CRC Press.
	eResources addresses	Adresy na platformie eNauczanie: Computer Aided Design - 2022/23 - Moodle ID: 26626 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26626

Example issues/ example questions/ tasks being completed	Methane or methanol may be oxidized with air to produce formaldehyde and water in a continuous reactor. The methane or methanol are fed at 25 °C, while the air is preheated to 100 C. Both have a pressure of 1 bar. With a silver catalyst 80% conversation takes place for methanol. For both reactions - How much formaldehyde is produced? (nearest mol/h)

Work placement	Not applicable