GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Purification of Gases and Sewage, PG_00039905		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Optional subject group 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	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Bartosz Dawidowicz	
	Teachers	dr inż. Bartosz Dawidowicz dr inż. Blanka Jakubowska	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

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	30	6.0	14.0	50

Subject objectives

Providing students with basic methods of particle control in gases and gaseous pollutants neutralization. To provide them with principles of water and wastewater treatment. To teach basic principles of chosen devices in the wastewater treatment systems design

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U11] is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria	Based on the technical data of devices, processes and technologies, students select the right solution to the given problem, meeting the safety, environmental, economic and legal criteria.	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle	Students are able to make technical calculations, know how to make a project and know what materials should be used to make individual elements of the device.	[SW1] Assessment of factual knowledge
[K6_W12] possesses basic knowledge necessary to understand the ex-technical conditions of engineering activity, possesses basic knowledge on management, including quality management and running commercial enterprise, within the range of protection of intellectual property and patent law; knows general principles of creating and developing forms of individual entrepreneurship and basic HSE rules applicable to machine industry	The student designs machines and selects devices in accordance with the principles of occupational health and safety, understands the non-technical determinants of engineering activities, which is intellectual property and patent rights.	[SW1] Assessment of factual knowledge

Subject contents	LECTURE Industrial particle pollutants - examples and construction of the particulate control devices. Removal of chemical gaseous pollutants. Biotechnological plants. Water in the industrial processes - types of pollutants. Ecological significance of the industrial wastewater. Wastewater treatment in different industrial branches. Types of the wastewater treatment plants. Machines, apparatus and reactors for the physical, chemical and biological treatment. Modern trends in wastewater treatment plants. LABORATORY Study of cyclone and dust chamber. Laboratory of wastewater treatment plant.
Prerequisites and co-requisites	Building on the basic information about mass transfer and on the subject of Unit processes and operations.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory - tests	56.0%	50.0%
Test from lecture	56.0%	50.0%

Recommended reading

Basic literature	Warych J.: Oczyszczanie przemysłowe gazów odlotowych, WNT W-wa, 1994, Aarne, Jeffrey, Weiner, Environmental Engineering. Butterworth Publishers, Stoneham, 1998, Bever, Stein, Teichman, Zaawansowane metody oczyszczania ścieków. ProjprzemEko, Bydgoszcz, 1997, Gawroński, Procesy oczyszczania cieczy. Oficyna Wydawnicza Polit. Warsz., Warszawa, 1999, Łomotowski, Szpindor, Nowoczesne systemy oczyszczania ścieków. Arkady, Warszawa, 1999.
Supplementary literature	Kowal, Świderska-Bróż, Oczyszczanie wody. PWN, Warszawa, 2007, Ruefner, Rosenwinkel, Oczyszczanie ścieków przemysłowych. Projprzem-Eko, Bydgoszcz, 1998.
eResources addresses	Adresy na platformie eNauczanie: Oczyszczanie gazów i ścieków (M:31562W0) - Moodle ID: 29702 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29702

Example issues/ example questions/ tasks being completed	1. Construction and principle of operation of the electrofilter. 2. Types and characteristics of filter layers. 3. Methods for the removal of nitrogen oxides from exhaust gases. 4. Methods for removing sulfur oxides from waste gases. 5. Construction and principle of operation of settlers. 6. Methods for removing nitrogenous compounds from wastewater.
Work placement	Not applicable