GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Neutralization and Dedusting of Conbustion Gases, PG_00042173		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
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	

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	3.0	17.0	50

Subject objectives

Providing students with basic knowledge of devices and process in the dust extraction and gas pollutions removal from exhaust gases.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W13	The student has theoretical knowledge of the construction and operation of power devices and the basics of their operation.	[SW1] Assessment of factual knowledge
K6_U03	Solves technical problems in accordance with the rules and professional ethics, knows the consequences of this. Solves problems in cooperation with other teams.	[SU3] Assessment of ability to use knowledge gained from the subject
K6_U08	The student is able to independently perform a project using engineering tools and make correct calculations and interpretations of the obtained results.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Lecture Dusts. Definitions, classifications, sources. Mechanisms of dust extraction. Dust separators: classification, dominating phenomena. Gravitational and inertial dust separators. Centrifugal gas separators. Filters. Electrostatics precipitators. Scrubbers. Dust separator efficiency. General characteristics of dust separators. Gas pollutions. Desulfurization. Desulfurization of fuels. Desulfurization of exhaust gases. Comparison of dry and wet methods. NOx removal. Limitation of NOx emission in combustion process. NOx removal from exhaust gases. Simultaneus removal of nitric and sulfur oxides. Removal of gaseous inorganic and volatile organic compounds. Removal of chlorine, fluorine and their compounds. Biological purification of gases. Laboratory 1. Dust extraction in sedimentation chamber. 2. Dust extraction in sedimentation chamber with conical baffle. 3. Dust separation in cyclones. 4. Laboratory for the construction and operation of electrostatic precipitators, fabric filters, scrubbers, etc.

Prerequisites and co-requisites

fundamentals of physics, chemistry, thermodynamics and fluid mechanics

Assessment methods and criteria

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

Recommended reading	Basic literature	1. Kabsch P.: Dust extraction and dust extractors. T. 1 i 2. WNT, W-wa, 1992 (in Polish). 2. Warych J.: Gas cleaning. Processes and devices. WNT, W-wa, 1998. 3. Mazur M., Teisseyre M.: Fundamentals of theory and construction of dust separators. Skrypty PWr., Wrocław, 1977. 4. Juda J., Nowicki M.: Dust extractors. PWN, W-wa, 1979.
	Supplementary literature	Chmielniak T.: Energetic technologies. WNT, W-wa, 2008.
	eResources addresses	Adresy na platformie eNauczanie: Neutralizacja i odpylanie spalin W/L, En, I st., sem. 7, zima 23/24 (PG_00042173) - Moodle ID: 34003 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34003
Example issues/ example questions/ tasks being completed	What is the idea of multicyclone? Why modern core separator works with a higher efficiency then cyclone? What are the methods of removing nitrogen oxides from exhaust gases?	
Work placement	Not applicable	