



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. Simultaneous 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	<p>What is the idea of multicyclone?</p> <p>Why modern core separator works with a higher efficiency then cyclone?</p> <p>What are the methods of removing nitrogen oxides from exhaust gases?</p>	
Work placement	Not applicable	