GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fire ventilation systems, PG_00064750		
Field of study	Power Engineering, Power Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
Education level	second-cycle studies	Subject group	Specialty 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sylwia Fudala-Książek	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	30.0	0.0	60

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	60	8.0	32.0	100

Subject objectives

The aim of the course is to familiarise you with the basic theoretical issues and practical problems related to fire ventilation of buildings, including smoke extraction and smoke prevention systems, current legislation and standards related to the subject.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W03] demonstrates structured and theory supported knowledge encompassing key issues in the field of Power Engineering, enabling design of energy systems, machines and devices, transmission grids and internal installations	Students will be able to design energy systems, machinery and equipment, transmission networks and internal installations in the field of Power Engineering.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U04] creatively designs or modifies, either entirely or at least in part, energy systems, machines and devices, transmission grids and internal installations, considering both technical and non-technical aspects, estimating costs and utilizing design techniques appropriate for tasks within the scope of Power Engineering	The student is able to design and modify, as a whole or at least in part, energy systems, machines and equipment, transmission networks or internal installations according to a given specification, taking into account technical and non-technical aspects. The student is able to determine costs using design techniques appropriate to tasks in the field of Power Engineering.	[SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task
[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study	The student has the ability to determine the usefulness and applicability of new developments (techniques and technologies) in the performance of tasks specific to the field of study	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information

<table>
<tr><td>Subject contents</td><td>Course content – lecture

Lectures: Smoke properties, characteristic parameters and their calculation methods. Effect of smoke on evacuation. Smoke hazards. Smoke flow in buildings. System of protection of escape routes in multi-storey buildings. Smoke extraction systems for large volume premises. Smoke extraction in garages. Tunnels. Fire ventilation equipment and components. Legal regulations, standards, technical requirements, construction and protection principles of fire protection. Exercises: Fire characteristic parameters, fire power, fire curve, required evacuation time for underground garage calculation methods. Smoke prevention systems calculation of the required system capacity with boundary conditions according to EN 12101-13. Sizing of fans and other devices including fire dampers. Design documentation guidelines. Design: As part of the project, a conceptual design of the fire ventilation system for the underground car park should be carried out.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge of basic thermodynamics, fluid mechanics, mechanical ventilation. Ability to draw in CAD software. Knowledge of the subject: Heating, Ventilation and Air Conditioning and Domestic Ventilation and Air Conditioning Systems.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Exercises</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>Lecture exam</td><td>60.0%</td><td>40.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1. Mizieliński, B., Kubicki, G. Wentylacja pożarowa i oddymianie. Wydawnictwo WNT, 2017.
2. Wojciech Węgrzyński, Krajewski G., Węgrzyński W. Systemy wentylacji pożarowej garaży. Projektowanie, ocena, odbiór.
3. Instrukcje,
4. Wytyczne,
5. Poradniki nr 493/2015. Instytut techniki Budowlanej.
6. Kaiser, K. Wentylacja pożarow</td></tr>
<tr><td>Supplementary literature</td><td>Svensson, Stefan. Fire ventilation. Swedish Civil Contingencies Agency (MSB), Maj 2020. ISBN: 978-91-7927-036-0</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. With the given boundary conditions, calculate the time required to evacuate the underground garage.2. calculate the required air volume for ducted smoke extraction of the garage according to BS.3. calculate the required fan capacity for mechanical compensation of gravity smoke ventilation according to CNBOP guidelines.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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