GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Environmental monitoring and control, PG_00064749		
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	2.0
Learning profile	general academic profile	Assessment form	assessment
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 inż. Filip Gamoń	
	Teachers		

Lesson types

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	5.0	15.0	50

Subject objectives

The aim of the course is to present the basic theoretical issues and practical problems related to monitoring and analysis of environmental pollution.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U02] formulates and tests hypotheses concerning problems related to energy conversion processes, their efficiency, control, safety and impact on the environment, as well as simple research problems	The student is able to recognize the risks of health and life in the use of electrical equipment, has the ability to respond appropriately in emergency situations that may result from failures, improper use of power equipment and their design and implementation errors	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K7_W01] explains and describes, based on general knowledge in the field of scientific disciplines forming the theoretical foundations of Power Engineering, the structure, principles of operation and evironmental impact of energy systems, machines and devices, transmission grids and internal installations	The student uses concepts and specialized language in the field of environmental pollution monitoring and analysis. The student is able to collect and measure data in environmental pollution monitoring and analysis, including typical indoor pollutants (e.g., particulate matter, gaseous compounds). The student is able to find solutions to minimize the impact of indoor air pollution on health.	[SW2] Assessment of knowledge contained in presentation

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

1 Introduction to indoor air quality. Ventilation concept, methodologies and measurement techniques. Evaluation of ventilation performance.2. Gaseous pollutants: Volatile organic compounds (VOCs), ozone, and combustion-related air pollutants (i.e., carbon monoxide and nitrogen dioxide).3. particulate matter (PM).4. bioaerosols, asbestos and radon.5. control of airborne particles: Filtration6. comparison of different types of sensors for monitoring pollution7. software for developing pollution data</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of chemistry, physics, fluid mechanics. Basic knowledge of programming languages. Knowledge of the following topics: ventilation, air monitoring and treatment.</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>Test of the laboratory part</td><td>51.0%</td><td>40.0%</td></tr>
<tr><td>Lecture test</td><td>51.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Spengler, J., McCarthy, J., and Samet, J. Indoor air quality handbook, McGrow-Hill Professional (2001).

Awbi, H.B, Ventilation of buildings, E&FN SPON (2003)

Morawska, L. and Salthammer, T., Indoor environment: airbone particles and settled dust Wiley-VCH (2003)</td></tr>
<tr><td>Supplementary literature</td><td>Zhang, Y., Indoor Air Quality Engineering, CRC Press (2004)

Godish, Thad. Indoor air pollution control. CRC press, 1989.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>During the course, students will be introduced to the fundamental topics related to environmental monitoring, including air, water, soil, noise, light, and electromagnetic field monitoring. Both theoretical and practical methods for analyzing environmental pollutants will be presented, along with a discussion of the legal foundations and standards for implementing monitoring in these areas. Additionally, advanced methods for monitoring pollution using tools of modern instrumental analysis will be showcased. Students will learn about the methods and devices used for environmental monitoring in energy and environmental engineering sectors. The students' task will be to apply the knowledge gained during the course to solve environmental protection and monitoring issues in the energy sector.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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