



Subject card

Subject name and code	Environmental monitoring and control, PG_00057355						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject				2023/2024	
Education level	second-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	1	Language of instruction				Polish	
Semester of study	2	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Metrology and Optoelectronics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Mattia Pierpaoli				
	Teachers						
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		8.0		37.0	75
Subject objectives	The aim of the course is to present the basic theoretical issues and practical problems related to the monitoring and analysis of environmental pollution.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_K05] is aware of the impact of engineering activities on the environment		The student is able to describe analytically and synthetically the problems associated with the issues of monitoring and analysis of environmental pollution. He is aware of the work that is done by a multi-discipline design team.			[SK1] Assessment of group work skills	
	[K7_W10] knows the basic installations of advanced energy systems, transmission networks and internal installations and their impact on the environment		The student uses concepts and specialised language in the field of environmental pollution monitoring and analysis. The student is able to collect and measure data in the field of environmental pollution monitoring and analysis, including typical indoor pollutants (e.g. particulate matter, gaseous compounds). Students will be able to find solutions to minimise the health impacts of indoor air pollution.			[SW3] Assessment of knowledge contained in written work and projects	
	[K7_K04] is able to react in emergency situations, health and life threatening when using power equipment		The student is able to recognize health and life hazards when using electrical devices, has the ability to react properly in emergency situations that may be the result of failures, improper use of power devices and their design and implementation errors			[SK1] Assessment of group work skills	

Subject contents	<p>1. Introduction to indoor air quality. Ventilation concept, methodologies and measurement techniques. Evaluation of ventilation efficiency.</p> <p>2. Gaseous pollutants: Volatile organic compounds (VOCs), ozone and combustion related air pollutants (i.e. carbon monoxide and nitrogen dioxide).</p> <p>3. Particulate matter (PM).</p> <p>4. Bioaerosols, asbestos and radon</p> <p>5. Airborne particle control: Filtration</p> <p>6. Comparison of different types of pollution monitoring sensors and techniques</p> <p>7. From data to knowledge: air pollutant data elaboration</p>											
Prerequisites and co-requisites	<p>Basic knowledge of chemistry, physics, fluid mechanics. Basic knowledge of programming languages. Knowledge of the subject: ventilation, monitoring and air treatment.</p>											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 956 794 981">Subject passing criteria</th> <th data-bbox="799 956 1137 981">Passing threshold</th> <th data-bbox="1142 956 1469 981">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 987 794 1012">Exam on lectures</td> <td data-bbox="799 987 1137 1012">60.0%</td> <td data-bbox="1142 987 1469 1012">50.0%</td> </tr> <tr> <td data-bbox="456 1019 794 1043">Project</td> <td data-bbox="799 1019 1137 1043">60.0%</td> <td data-bbox="1142 1019 1469 1043">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exam on lectures	60.0%	50.0%	Project	60.0%	50.0%
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Project	60.0%	50.0%										
Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>Spengler, J., McCarthy, J., and Samet, J. Indoor air quality handbook, McGraw-Hill Professional (2001).</p> <p>Awbi, H.B, Ventilation of buildings, E&FN SPON (2003)</p> <p>Morawska, L. and Salthammer, T., Indoor environment: airborne particles and settled dust Wiley-VCH (2003)</p> <p>Zhang, Y., Indoor Air Quality Engineering, CRC Press (2004)</p> <p>Godish, Thad. <i>Indoor air pollution control</i>. CRC press, 1989.</p>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											