



Subject card

Subject name and code	Modern Analytical Techniques, PG_00048919									
Field of study	Chemistry in Construction Engineering									
Date of commencement of studies	October 2023	Academic year of realisation of subject		2025/2026						
Education level	first-cycle studies	Subject group								
Mode of study	Full-time studies	Mode of delivery		at the university						
Year of study	3	Language of instruction		Polish						
Semester of study	6	ECTS credits		4.0						
Learning profile	general academic profile	Assessment form		assessment						
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology									
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Justyna Płotka-Wasyłka							
	Teachers		dr hab. inż. Justyna Płotka-Wasyłka							
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM			
	Number of study hours	15.0	0.0	30.0	0.0	15.0	60			
	E-learning hours included: 0.0									
eNauczanie source address: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=3783										
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		SUM				
	Number of study hours	60		5.0		35.0				
		100								
Subject objectives	Acquaintance with modern analytical techniques in theory and practice that will enable analysis building materials, monitoring and analytics of environmental pollution originating from squares construction, emitted from building materials									
Learning outcomes	Course outcome		Subject outcome			Method of verification				
	K6_W08		The student is able to analyze phenomena and provide methods for them analysis and monitoring, so much needed in terms of construction			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge				
	K6_U06		After completing the course, the student will have knowledge of issues related to analytical techniques, which can be used for analysis and pollution monitoring building materials and construction sites.			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment				
	K6_W03		After completing the course, the student will have knowledge of issues related to analytical techniques, which can be used for analysis and pollution monitoring building materials and construction sites.			[SW1] Assessment of factual knowledge				

Subject contents	<p>Course content – lecture</p> <p>1. Spectroscopic techniques used to analyze building materials</p> <p>2. Theoretical and practical basics in the use of chromatographic techniques. Analysis of building materials and processing of received data.</p> <p>3. Chemical sensors, an electronic nose type used to analyze and monitor release pollution from building materials.</p> <p>4. Micro-extraction techniques used to prepare samples for analysis. Building materials and their solid, liquid and gas impurities.</p>												
Prerequisites and co-requisites	Basic knowledge of chemistry. Knowledge of the dangers arising from emissions of building materials.												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="454 574 763 597">Subject passing criteria</th><th data-bbox="763 574 1140 597">Passing threshold</th><th data-bbox="1140 574 1481 597">Percentage of the final grade</th></tr> </thead> <tbody> <tr> <td data-bbox="454 597 763 619">lecture</td><td data-bbox="763 597 1140 619">60.0%</td><td data-bbox="1140 597 1481 619">45.0%</td></tr> <tr> <td data-bbox="454 619 763 642">seminars</td><td data-bbox="763 619 1140 642">60.0%</td><td data-bbox="1140 619 1481 642">10.0%</td></tr> <tr> <td data-bbox="454 642 763 687">lab</td><td data-bbox="763 642 1140 687">60.0%</td><td data-bbox="1140 642 1481 687">45.0%</td></tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	lecture	60.0%	45.0%	seminars	60.0%	10.0%	lab	60.0%	45.0%
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seminars	60.0%	10.0%											
lab	60.0%	45.0%											
Recommended reading	<p>Basic literature</p> <p>1. Marian Kamiński, Podstawowe pojęcia i parametry opisujące układy chromatograficzne. Podstawowe zasady efektywnego stosowania chromatografii cieczowej do rozdzielania i oznaczania składu mieszanin, PG, 2010</p> <p>2. Praca zbiorowa pod redakcją M. Kamiskiego Chromatografia cieczowa, CEEM, Gdańsk, 2004.</p> <p>3. D. Berek, M. Dressler, M. Kubin, K. Marcinka Chromatografia elowa PWN Warszawa 1989.</p> <p>4. European Committee for Standardization, Safety of toys. Organic chemical compounds. Methods of analysis, BS EN 71-11:2005</p> <p>5. M. Marć, B. Zabiegała, J. Namieśnik, Trends Anal. Chem., 32 (2012) 76</p> <p>6. A. Kot-Wasik, B. Zabiegała, M. Urbanowicz, E. Dominiak, A. Wasik, J. Namieśnik, Anal. Chim. Acta 602 (2007) 141</p> <p>7. M. Urbanowicz, B. Zabiegała, J. Namieśnik, Anal. Bioanal. Chem., 399 (2011) 277</p> <p>8. A. Cygański, Podstawy metod elektroanalizycznych, WNT, Warszawa, 1999.</p> <p>9. S L R Ellison, A Williams, Quantifying Uncertainty in Analytical Measurement, EURACHEM/CITA, 2011.</p>												
	<p>Supplementary literature</p> <p>J. Warych, Oczyszczanie przemysłowy gazów oddechowych, WNT, Warszawa, 1988.</p> <p>W. Lewandowski, Techniczno-technologiczne i aparaturowe aspekty ochrony powietrza, Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2011</p>												
eResources addresses													
Example issues/ example questions/ tasks being completed	Gas chromatography, liquid chromatography, spectroscopic techniques, sensors, electronic nose, qualitative analysis, quantitative analysis, building materials, dust emissions from building materials and construction sites, monitoring, road infrastructure and environmental pollution												
Practical activites within the subject	Not applicable												

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