



Subject card

Subject name and code	Modern Analytical Techniques, PG_00048919						
Field of study	Chemistry in Construction Engineering						
Date of commencement of studies	October 2022	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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Justyna Płotka-Wasyłka					
	Teachers						
Lesson types and methods of instruction	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						
	Address on the e-learning platform: 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		Self-study		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_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		
	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		

Subject contents	<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" data-bbox="448 528 1487 667"> <thead> <tr> <th data-bbox="448 528 794 566">Subject passing criteria</th> <th data-bbox="794 528 1141 566">Passing threshold</th> <th data-bbox="1141 528 1487 566">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 566 794 600">lecture</td> <td data-bbox="794 566 1141 600">60.0%</td> <td data-bbox="1141 566 1487 600">45.0%</td> </tr> <tr> <td data-bbox="448 600 794 633">seminas</td> <td data-bbox="794 600 1141 633">60.0%</td> <td data-bbox="1141 600 1487 633">10.0%</td> </tr> <tr> <td data-bbox="448 633 794 667">lab</td> <td data-bbox="794 633 1141 667">60.0%</td> <td data-bbox="1141 633 1487 667">45.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	lecture	60.0%	45.0%	seminas	60.0%	10.0%	lab	60.0%	45.0%
Subject passing criteria	Passing threshold	Percentage of the final grade													
lecture	60.0%	45.0%													
seminas	60.0%	10.0%													
lab	60.0%	45.0%													
Recommended reading	<table border="1" data-bbox="448 674 1487 1906"> <tbody> <tr> <td data-bbox="448 674 794 1738">Basic literature</td> <td colspan="2" data-bbox="794 674 1487 1738"> <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 redakcj M. Kamiskiego Chromatografia cieczowa, CEEM, Gdask, 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 elektroanalitycznych, WNT, Warszawa, 1999.</p> <p>9. S L R Ellison, A Williams, Quantifying Uncertainty in Analytical Measurement, EURACHEM/CITA, 2011.</p> </td> </tr> <tr> <td data-bbox="448 1738 794 1868">Supplementary literature</td> <td colspan="2" data-bbox="794 1738 1487 1868"> <p>J. Warych, Oczyszczanie przemysłowycy gazów odlotowych, WNT, Warszawa, 1988.</p> <p>W. Lewandowski, Techniczno-technologiczne i aparaturowe aspekty ochrony powietrza, Wydawnictwo Poli-techniki Gdańskiej, Gdańsk, 2011</p> </td> </tr> <tr> <td data-bbox="448 1868 794 1906">eResources addresses</td> <td colspan="2" data-bbox="794 1868 1487 1906">Adresy na platformie eNauczanie:</td> </tr> </tbody> </table>			Basic literature	<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 redakcj M. Kamiskiego Chromatografia cieczowa, CEEM, Gdask, 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 elektroanalitycznych, WNT, Warszawa, 1999.</p> <p>9. S L R Ellison, A Williams, Quantifying Uncertainty in Analytical Measurement, EURACHEM/CITA, 2011.</p>		Supplementary literature	<p>J. Warych, Oczyszczanie przemysłowycy gazów odlotowych, WNT, Warszawa, 1988.</p> <p>W. Lewandowski, Techniczno-technologiczne i aparaturowe aspekty ochrony powietrza, Wydawnictwo Poli-techniki Gdańskiej, Gdańsk, 2011</p>		eResources addresses	Adresy na platformie eNauczanie:				
Basic literature	<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 redakcj M. Kamiskiego Chromatografia cieczowa, CEEM, Gdask, 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 elektroanalitycznych, WNT, Warszawa, 1999.</p> <p>9. S L R Ellison, A Williams, Quantifying Uncertainty in Analytical Measurement, EURACHEM/CITA, 2011.</p>														
Supplementary literature	<p>J. Warych, Oczyszczanie przemysłowycy gazów odlotowych, WNT, Warszawa, 1988.</p> <p>W. Lewandowski, Techniczno-technologiczne i aparaturowe aspekty ochrony powietrza, Wydawnictwo Poli-techniki Gdańskiej, Gdańsk, 2011</p>														
eResources addresses	Adresy na platformie eNauczanie:														
Example issues/ example questions/ tasks being completed	Gas chromatography, liquid chromatography, spectroscopic techniques, sensors, electronic night, qualitative analysis, quantitative analysis, building materials, dust emissions from building materials and construction sites, monitoring, road infrastructure and environmental pollution														
Work placement	Not applicable														