



Subject card

Subject name and code	Instrumental Analysis, PG_00053082						
Field of study	Chemistry						
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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department Of Analytical Chemistry -> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Piotr Konieczka				
	Teachers		prof. dr hab. inż. Piotr Konieczka prof. dr hab. inż. Andrzej Wasik dr inż. Bartłomiej Cieślik dr hab. inż. Weronika Hewelt-Belka Paweł Hać prof. dr hab. inż. Bożena Zabiegała dr hab. inż. Mariusz Marć				
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		2.0		18.0	50
Subject objectives	The analytical process, instrumental analytical methods (primary and absolute methods, indirect methods); theoretical basis and description of selected instrumental analytical techniques (spectroscopic techniques; chromatographic techniques and related, hyphenated techniques).						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U07		can make accurate and precise measurement in the analytical laboratory		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	K6_W03		has a basic knowledge of trends in the area of theoretical chemistry and is familiar with a number of engineering disciplines related to theoretical chemistry		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U08] is capable to design and carry out the experiment which is necessary to confirm a given hypothesis and sees wider context, often beyond-technical, of the analysed phenomena		can design and conduct an experiment		[SU4] Assessment of ability to use methods and tools		

Subject contents	Chromatographic techniques: -quantitative analysis in GC -chromatographic detectors - the principle of operation and the area of use - liquid chromatography -mass spectrometry in chromatography Hyphenated techniques -use in analytics Extraction techniques as a step of sample preparation		
Prerequisites and co-requisites	Basic knowledge of analytical chemistry on the theory of instrumental methods of analysis.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	60.0%	50.0%
	participation in the lectures	0.0%	50.0%
Recommended reading	Basic literature	1. A. Cygański, Metody spektroskopowe w chemii analitycznej, WNT, Warszawa, 2002. 2. Z. Witkiewicz, J. Hepter, Chromatografia gazowa, WNT, Warszawa, 2009. 3. W. Szczepaniak, Metody instrumentalne w analizie chemicznej, PWN, Warszawa 2008.	
	Supplementary literature	1. K. Kuklińska, A. Melnyk, B. Zabiegała, Spektrometr mas jako detektor chromatograficzny, połączenie GC-MS, Wydawnictwo PG, Gdańsk 2014	
	eResources addresses	Adresy na platformie eNauczanie: Chemia - Analiza Instrumentalna - 2023/2024 - Moodle ID: 37240 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=37240	
Example issues/ example questions/ tasks being completed	1 Give a definition of BTV. Explain how this parameter can be used in describing the sorption strength of a solid sorbent? 2. define the parameters that characterise the sorption media used for sampling analytes from the gas phase. 3. explain the principle of two-stage thermal desorption. 4. how (theoretically) using the gas chromatography technique can the BTV breakthrough volume be determined for the system: selected compound and adsorbent 5 Describe the principle of operation of a Split/Splitless dispenser operating in the splitless mode. 6. describe the phenomenon of discrimination. How it affects the quality of the chromatographic determination results obtained. 7) What is a typical CV-AAS instrument made up of? 8) State the basic parameters (descriptively) characterising the CV-AAS technique. 9) What are the physical and chemical properties of mercury used in the CV-AAS technique? 10. list the advantages of the CV-AAS technique. Translated with www.DeepL.com/Translator (free version)		
Work placement	Not applicable		

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