



Subject card

Subject name and code	Process Analytics, PG_00048926						
Field of study	Chemistry in Construction Engineering						
Date of commencement of studies	October 2020		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	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Błażej Kudłak				
	Teachers		dr hab. inż. Błażej Kudłak dr hab. inż. Justyna Kucińska-Lipka dr inż. Maciej Sienkiewicz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	20.0	0.0	10.0	50
	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	50		5.0		45.0	100
Subject objectives	Acquainting with measurements and analytical techniques used in process analysis , especially with measurements in industry						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U08		student knows how to elaborate and present research methods on basic and advanced technological processes and select instruments aimed for it		[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		
	K6_W08		student is aware of and understands technical and non-technical aspects and results of engineer activity, student has detailed knowledge on research methods and techniques especially on analytics of construction resources		[SW1] Assessment of factual knowledge		

Subject contents	Lectures General problems.Types of measuring signals, measuring range and errors, dynamic properties. Selectivity and specificity. Response time and costs of analysis. Measuring of physical and physicochemical properties. Calibration of measurin devices. General characteristic of industrial measurements. Measuring of physical and chemical properties (pH, density, viscosity). Measuring of chemical composition. Problems related with sampling for continous analysis. Continous methods of analysis. Analysis of gases, liquids and solids.		
Prerequisites and co-requisites	Basic knowledge of chemical analysis		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	60.0%	60.0%
	laboratory: average tests ratings	60.0%	20.0%
	presentation and class participation	60.0%	20.0%
Recommended reading	Basic literature	1. E. Romer, Miernictwo przemysłowe, PWN, Warszawa, 1970 2. M. Trojanowicz, Automatyzacja w analizie chemicznej, WNT, Warszawa, 1972 3. J. Piotrowski (red), Pomiary. Czujniki i metody pomiarowe wybranych wielkosci fizycznych i składu chemicznego, WNT, Warszawa, 2009	
	Supplementary literature	P.N. Cheremisinoff, H.J. Perlis, Analytical measurements and instrumentation for process and pollution control, Ann Arbor Science, 1981	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. name what parameters/requirements should perfect analyzer have 2. describe ranges of responsibility and competencies of engineers and chemists in the area of construction chemistry 3. describe methods of processing, applicability, calibration of xxxxxx (group of process analyzer)		
Work placement	Not applicable		