



## Subject card

Subject name and code	Technical Analytics and Quality Control, PG_00048865						
Field of study	Engineering and Technologies of Energy Carriers						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study Subject group related to practical vocational preparation		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		6.0		
Learning profile	practical profile		Assessment form		exam		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Patrycja Makoś-Chełstowska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	60.0	0.0	0.0	90
	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	90		10.0		50.0	150
Subject objectives	General rules and selected specific procedures of technical and industrial analytics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U04		Theoretical and practical knowledge on the selection of methodology for conducting qualitative and quantitative research on individual energy carriers. Ability to adapt existing techniques and methods to new applications.		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject		
	K7_U02		Theoretical and practical knowledge allowing verification of the correct implementation of complex processes and technologies on the basis of a planned cycle of research in the field of technical analytics and quality control.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	K7_W07		Theoretical and practical knowledge about the physicochemistry of individual research techniques and methodologies.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	K7_U01		Theoretical and practical knowledge of scope of analysis and interpretation of test results. Ability to predict test results based on knowledge of the characteristics of the tested material / sample.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
Subject contents	Technical analytics and quality control in the scope of engineering and technologies of energy sources.						

Prerequisites and co-requisites	Knowledge of inorganic and organic chemistry as well as physical, analytical chemistry and chemical technology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	60.0%	20.0%
	Exam	60.0%	80.0%
Recommended reading	Basic literature	J.G. Speight, Handbook of Petroleum Analysis, WILEY-Interscience, 2015  J.G. Speight, Handbook of Coal Analysis, WILEY-Interscience, 2005  Standard test methods PN/EN, ASTM, GLP/GMP; PN-EN-ISO 9001; PN-EN-ISO/IEC 17025	
	Supplementary literature	1. Z. Witkiewicz, „Podstawy chromatografii” WNT, W-wa, 2005. 2. M. Kamiński (ed.) „Chromatografia Cieczowa”, CEEAM, Gdańsk, 2004. 3. J. Weiss, “Handbook of ion chromatography”, vol. 1,2, Willey-VCH 2004. 4. W. Zieliński, A. Rajca (red.): „Metody spektroskopowe i ich zastosowanie do identyfikacji związków organicznych”, WNT, W-wa, 1995. 5. J. Cazes (ed) “Encyclopedia on Chromatography”, Marcel Dekker, New York, 2001 (or newer edition)  6. J. Namieśnik, P. Konieczka, Kontrola i zapewnienie jakości wyników pomiarów analitycznych, PTIE, 2006.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Lectures  Module I. General rules of technical analytics and quality control  Module II. Selected, most important techniques and methods for analysis of raw materials, process streams, products, auxiliary materials  Module III. Quality assurance of data  Laboratory  Selected practical tasks in the scope of the subject.		
Work placement	Not applicable		

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