



Subject card

Subject name and code	Quality of petroleum products, PG_00068886						
Field of study	Chemical Technology						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2029/2030	
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				1.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Patrycja Makoś-Chełstowska					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	5.0	0.0	10.0	0.0	0.0	15
	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	15	2.0		8.0	25	
Subject objectives	The aim of the course is to familiarize students with the quality requirements for petroleum products, the methods used to assess them, and the impact of quality parameters on functional properties and operational safety.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W07] Has knowledge of raw materials and technologies in the chemical and polymer industries, also covering issues of corrosion and material protection.	possesses knowledge of the physicochemical properties of petroleum products, their raw materials, and production technologies, and understands the impact of product quality on technological processes, material durability, as well as issues related to corrosion and material protection in the chemical industry.			[SW2] Assessment of knowledge contained in presentation		
	[K6_U08] Is able to select elements of automatic control systems for simple technological processes and use computer programs to control and optimize chemical processes.	is able to select appropriate methods and procedures for assessing the quality of petroleum products, use available IT tools to analyze test results, and adjust technological process parameters to achieve the highest possible product quality.			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K6_K01] Is aware of the social role of a technical university graduate and understands the need to provide information about technical achievements and engineering activities to society, including through the media.	is aware of the importance of petroleum product quality for safety, environmental protection, and technological development, and understands the need to disseminate knowledge about quality requirements and achievements in fuel technology to the public, including through modern media.			[SK4] Assessment of communication skills, including language correctness		

Subject contents	Course content – lecture <ul style="list-style-type: none"> Principles of sampling crude oil and petroleum products. Preparation of samples for qualitative and quantitative analysis. Isolation, separation, and fractionation of analytes. Examination of basic physicochemical and technical parameters of petroleum products. Performing measurements using spectroscopic, chromatographic, electroanalytical, X-ray, and other methods. Evaluation and quality control of measurement results. 		
	Course content – laboratory <ul style="list-style-type: none"> Examination of basic parameters of petroleum products: density, refractive index, color, UV-VIS spectrum, kinematic viscosity, presence of water and contaminants, and determination of laboratory repeatability of the testing method / degree of contamination. Analysis of the composition of gaseous fuels using gas chromatography. Analysis of the composition of liquid fuels and process streams: gasoline, gasoline fractions, bioethanol. Determination of overall parameters of complex mixtures: distillation temperature distribution (classical distillation / SIMDIS), molecular weight distribution (GPC-SEC UV-VIS-DAD/RID/LLSD), fraction A / C / D // TAG // FAME. 		
Prerequisites and co-requisites	<ul style="list-style-type: none"> Basic knowledge of organic and inorganic chemistry. Fundamentals of physical chemistry, including understanding concepts such as viscosity, density, surface tension, and phase equilibria. Fundamentals of chemical analysis ability to perform simple qualitative and quantitative analyses. General understanding of unit operations and equipment used in the chemical industry. 		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	60.0%	60.0%
	Laboratory	60.0%	40.0%
Recommended reading	Basic literature	J.G. Speight, Handbook of Petroleum Analysis, WILEY-Interscience, 2015 Standard test methods PN/EN, ASTM, GLP/GMP; PN-EN-ISO 9001; PN-EN-ISO/IEC 17025	
	Supplementary literature	Z. Witkiewicz, Podstawy chromatografii WNT, W-wa, 2005. M. Kamiński (ed.) Chromatografia Cieczowa, CEEAM, Gdańsk, 2004. J. Weiss, Handbook of ion chromatography, vol. 1,2, Willey-VCH2004. W. Zieliński, A. Rajca (red.): Metody spektroskopowe i ich zastosowanie do identyfikacji związków organicznych, WNT, W-wa, 1995. J. Cazes (ed) Encyclopedia on Chromatography, Marcel Dekker, New York, 2001 (or newer edition)	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> Knowledge of the basic quality parameters of liquid and gaseous fuels. The significance of octane and cetane numbers in fuel quality assessment and methods of determination. Comparison of classical distillation and SIMDIS methods in the analysis of petroleum products. How do contaminants in petroleum products affect material durability and corrosion? 		
Practical activities within the subject	Not applicable		

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