



Subject card

Subject name and code	Analytics in the cosmetics and pharmaceutical industry, PG_00060779						
Field of study	Chemical Technology						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2028/2029		
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	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Weronika Hewelt-Belka					
	Teachers						
Lesson types	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 course introduces modern analytical methods used in the cosmetic and pharmaceutical industries. It covers instrumental techniques for analyzing both conventional substances and advanced pharmaceuticals such as monoclonal antibodies, peptides, and oligonucleotides. Students learn method validation, stability testing, green chemistry principles, and assessment of substance migration from packaging into products. The course includes guest lectures from industry practitioners.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K02] is aware of the responsibility for his/her work and is ready to work in a team and share responsibility for common tasks.	is able to work effectively in a laboratory team, demonstrates professional responsibility, and performs analyses with integrity, understanding their importance for product quality and consumer safety.	[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
	[K6_W02] Possesses the chemical knowledge necessary to synthesize, analyze and evaluate the properties of compounds and processes used in chemical technology.	has knowledge of the properties of compounds used in cosmetic and pharmaceutical products and of analytical methods applied to evaluate their quality, stability and safety, including instrumental techniques.	[SW1] Assessment of factual knowledge
	[K6_W03] Has knowledge in the field of chemical technology and environmental protection, including sustainable development, green chemistry, modern energy sources and the principles of minimizing the impact of industrial processes on the environment and work safety	understands the principles of green chemistry and methods for reducing the environmental impact of analytical and production processes. The student is aware of the importance of sustainable development and workplace safety in cosmetic and pharmaceutical analysis.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_U02] Performs design calculations of technological processes, selects industrial equipment, operates laboratory equipment and conducts material analyses	is able to operate basic analytical instruments used in the quality control of cosmetics and pharmaceuticals, perform measurements, and interpret analytical results. The student understands how to select appropriate methods and techniques depending on the sample type.	[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 [SU5] Assessment of ability to present the results of task	
Subject contents	<p>Course content – lecture</p> <p>The lectures cover key topics related to analytical methods used in the cosmetic and pharmaceutical industries. The content includes an overview of raw materials and active substances, instrumental techniques applied in quality control, fundamentals of method validation, and selected aspects of green chemistry. Additional topics may include modern biopharmaceutical products and safety assessment, such as the evaluation of substance migration from packaging. Lectures may also be supplemented with presentations delivered by industry professionals.</p> <p>Course content – laboratory</p> <p>The laboratory classes focus on the practical application of selected analytical techniques used in cosmetic and pharmaceutical analysis. Students prepare samples, perform instrumental measurements, analyze product composition and quality, and learn the basics of method validation. The laboratory work may include studies on product stability, evaluation of substance migration from packaging, and preparation of analytical reports with interpretation of results.</p>		
Prerequisites and co-requisites	The student should have basic knowledge of analytical, organic, and physical chemistry, including qualitative and quantitative analysis, fundamentals of chromatography and spectroscopy, and safe laboratory practices.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory grade (tests and reports)	60.0%	60.0%
	Final test	60.0%	40.0%
Recommended reading	Basic literature	<p>Norbert Andrzejewski, Analiza produktów leczniczych i wyrobów medycznych, MEDPHARM, 2025</p> <p>Szczepaniak Walenty, Metody instrumentalne w analizie chemicznej, Wydawnictwo Naukowe PWN</p> <p>Wardencki Waldemar, Kałużna-Czaplińska, Joanna Malinowska, Irena Witkiewicz Zygfryd, Wydawnictwo Naukowe PWN</p>	
	Supplementary literature	<p>D'Atri V, Barrientos RC, Losacco GL, Rudaz S, Delobel A, Regalado EL, Guillarme D. Trends in Pharmaceutical Analysis: The Evolving Role of Liquid Chromatography. Anal Chem. 2025 Mar 11;97(9):4706-4727. doi: 10.1021/acs.analchem.4c06662. Epub 2025 Feb 26. PMID: 40008977.</p>	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Examples of analytical techniques applied in the quality assessment of cosmetic and pharmaceutical products. Discussion of challenges related to the analysis of modern active substances, including biological and biotechnological compounds. Consideration of green chemistry principles and methods aimed at reducing the environmental impact of analytical procedures. Case studies on quality control, product safety, and migration of substances from packaging materials. Tasks involving the interpretation of analytical results and evaluation of method performance parameters.
Practical activities within the subject	Not applicable

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