



## Subject card

Subject name and code	DIPLOMA LABORATORY, PG_00048174						
Field of study	Green Technologies						
Date of commencement of studies	October 2024		Academic year of realisation of subject			2025/2026	
Education level	second-cycle studies		Subject group			Obligatory subject group 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 Niektóre instrukcje lub literatura źródłowa może być dostępna jedynie w języku angielskim	
Semester of study	3		ECTS credits			5.0	
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		dr inż. Bartłomiej Cieřlik				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	75.0	0.0	0.0	75
	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	75		15.0		40.0	130
Subject objectives	The aim of the course is to conduct laboratory tests necessary for the completion of a diploma thesis.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_K02] is ready to work together as a team, taking in the different roles, can properly identify priorities for implementation specified by you or other tasks, is able to think and act in a creative and enterprising, has the ability to negotiate, is aware of its own limitations and know when to ask the experts		The student is able to organize research work in collaboration with a research team utilizing analytical laboratory resources. They know how to properly communicate their needs and can determine the need to seek assistance for consultation on more advanced research issues.			[SK1] Assessment of group work skills	
	[K7_K03] can consciously and supported by the experience to present your work, provide information in a manner commonly understood, to communicate, to make self-assessment and constructive criticism of the work of others, the reasons for different points of view		Having compiled extensive data sets, the student is able to present them in a comprehensible and accessible form, along with appropriate descriptions consistent with broadly understood engineering standards. The student is also able to recognize and communicate ambiguities in the presentation of research results.			[SK4] Assessment of communication skills, including language correctness	
	[K7_W01] a broader and deeper knowledge of certain branches of mathematics, including elements of applied mathematics and optimization methods including mathematical methods, useful to formulate and solve complex tasks in the field of environmental technologies and modern analytical methods		Students can analyze large data sets on a continuous basis and understand how to interpret chemical analysis results using knowledge of chemical statistics. They also understand how to collate obtained data and optimize analytical procedures.			[SW3] Assessment of knowledge contained in written work and projects	

Subject contents	During the course, students are tasked with independently planning and organizing research work, utilizing the resources available in the analytical laboratory and in collaboration with the research team. The ability to adequately communicate their needs and identify when consultation on more advanced research issues is essential. Students learn how to appropriately select research methods and equipment based on the intended purpose of the experiment. Preparing samples for analysis using dedicated laboratory techniques and ensuring their quality for further analysis is also crucial. A key part of the course involves conducting analyses using advanced spectrometers such as ASA, AES, MIP-OES, and ICP-MS. Students acquire practical skills in operating modern equipment and learn the capabilities and limitations of individual techniques. During the experiment, students optimize and validate the analytical procedures used, which improves the quality of the obtained results. The next step is the development of large experimental data sets, their ongoing analysis, and their interpretation using chemical statistics tools. The ultimate result of laboratory work is the preparation of results in the form of clear summaries, tables, and graphs, and their description in accordance with accepted engineering and scientific reporting standards. This allows students to develop competencies not only in planning and conducting research, but also in presenting and evaluating its results.		
Prerequisites and co-requisites	Students should be familiar with the rules governing work in an analytical laboratory, understand the organization of the laboratory, adhere to the laboratory's occupational health and safety regulations, and understand the need to familiarize themselves with the safety data sheets for the chemicals used. They should also have a basic understanding of how to operate standard chemical equipment and more advanced analytical equipment, as well as devices used at various stages of sample preparation.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Assessment of the implementation of research work	60.0%	100.0%
Recommended reading	Basic literature	j.w	
	Supplementary literature	Literature closely related to the characteristics of the work being carried out.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Examples of topics, questions, and tasks performed within the course are closely related to the specifics of a given thesis. They may include: - Planning a research experiment and selecting appropriate research equipment - Sample preparation using dedicated techniques - Analysis using advanced research equipment - Optimization and validation of implemented procedures - Analysis of the research results		
Work placement	Not applicable		

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