GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Master's thesis, PG_00047612						
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	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	2		Language of instruction	Polish Literatura może być dostępna w języku angielskim			
Semester of study	3		ECTS credits	20.0			
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 Cieślik				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	0.0	0
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14893						
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	0		50.0	450.0	500	
Subject objectives	The aim of the course is to prepare a master's thesis.						

Learning outcomes			
	Course outcome	Subject outcome	Method of verification
	[K7_K01] is ready to solve the most common problems associated with the profession of engineer, correctly identifies and resolves dilemmas associated with the profession of engineer, assesses risks and is able to assess the effects of the activity	The student is able to recognize and solve typical problems that arise during the completion of a thesis, both technical and organizational in nature. The student is able to properly identify and analyze research dilemmas related to the research topic and make informed decisions regarding the selection of methods and tools. The student is able to assess potential risks associated with the conducted research and is able to identify the consequences of adopted solutions in the context of environmental protection and engineering practice.	[SK5] Assessment of ability to solve problems that arise in practice
	[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	The student is able to consciously present the results of their own research, informed by experience. The student is able to convey information in a clear and understandable manner to both specialists and those outside the field. The student possesses the ability to critically evaluate themselves and formulate constructive assessments of the work of others, with the ability to justify different points of view.	[SK2] Assessment of progress of work
	[K7_U04] can be used to formulate and solve engineering tasks analytical methods, simulation and experimental, can make a critical analysis of the methods of operation and evaluate the existing technical solutions, in particular equipment, facilities, systems, processes, services in the field of environmental technology and make a preliminary economic analysis of engineering activities undertaken	The student is able to use analytical methods to formulate and solve engineering problems in the broad field of environmental analysis and environmental protection technologies. The student is able to select the appropriate technique for analyzing test samples and assess the suitability of the analytical methods used to solve the discussed engineering problem. The student is able to conduct a preliminary economic analysis to estimate the effectiveness of the proposed equipment for solving a given analytical problem.	[SU1] Assessment of task fulfilment
	[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 collaborate effectively within a research team to complete assigned tasks, assuming required roles depending on the needs and goals of the work. The student is able to set priorities necessary to complete complex tasks and act creatively in seeking optimal solutions. The student demonstrates the ability to communicate constructively within a team and is aware of their own limitations, allowing them to know when to seek the supervisor's opinion as part of the implementation of tasks.	[SK3] Assessment of ability to organize work
Subject contents	The course curriculum first involves selecting a thesis topic and defining the purpose and scope of the research, as well as analyzing the literature and existing solutions. Students then become familiar with research methodology, which includes selecting appropriate analytical, experimental, and simulation methods. Planning and organizing research is also crucial, taking into account equipment selection, method suitability assessment, and key economic and environmental aspects. The next stage is research design and implementation, which includes preparing experiments, conducting measurements, and collecting data. Significant emphasis is placed on analyzing results, interpreting them, assessing their reliability, and comparing them with literature and industry standards. A significant part of the program also involves preparing written results in accordance with formal requirements and editorial rules, as well as preparing and defending the thesis, which involves the ability to effectively present research results to both specialists and audiences outside the field.		
Prerequisites and co-requisites	Students should have a basic understanding of analytical chemistry and related instrumental analysis. They should be familiar with basic sample preparation techniques, including mineralization and extraction, and have knowledge of data analysis and statistics used in chemistry.		

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<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Assessment of the implementation of the work's results.</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Piotr Konieczka, Jacek Namieśnik "Quality Assurance and Quality in the Analytical Chemical Laboratory", CRC Press</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Depending on the specific nature of the thesis</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Examples of topics, questions, and tasks performed within the course are closely related to the specifics of the thesis. They may include: preparing samples for analysis, including mineralization processes using classical and microwave-assisted methods, selecting and optimizing measurement parameters, conducting quantitative analyses using spectroscopic methods, such as MIP-OES, AAS, ICP-MS, or spectrophotometric techniques, developing validation procedures and assessing the quality of results, interpreting experimental data in the context of the literature, standards, and applicable regulations, formulating conclusions regarding the effectiveness of the research methods used and their practical utility. Depending on the chosen topic, students may complete tasks involving both laboratory experiments and literature research, thus developing diverse research competencies.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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