GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DEVELOPMENT AND VALIDATION OF ANALYTICAL METHODS - PROJECT, PG_00064306		
Field of study	TWORZENIE I WALIDACJA METOD ANALITYCZNYCH - PROJEKT		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Specialty 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	4.0
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	prof. dr hab. inż. Andrzej Wasik	
	Teachers	prof. dr hab. inż. Andrzej Wasik	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	0.0	60.0	0.0	60

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 1783 TWORZENIE I WALIDACJA METOD ANALITYCZNYCH - PROJEKT
https://enauczanie.pg.edu.pl/2025/course/view.php?id=1783

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	60	5.0	35.0	100

Subject objectives

Familiarising students with the process of developing analytical methods used in chemical technology and their practical validation in accordance with the requirements of standards and guidelines. Students acquire the ability to plan and carry out project work involving the selection of analytical techniques, sample preparation, development of measurement procedures, and subsequent evaluation of validation parameters (including accuracy, precision, selectivity, and detection limit). The course also develops skills in teamwork, critical data analysis, presentation of results, and formulation of practical conclusions and recommendations for industrial and scientific applications.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U02] carries out experiments using properly selected techniques and apparatus, taking advantage of new developments in technology and related fields	knows the principles of selecting research techniques and measuring equipment for specific experimental tasks; has knowledge of new technological achievements and their potential applications in laboratory and industrial experiments; understands the principles of conducting experiments correctly, including requirements concerning work safety and the quality of results obtained.	[SU1] Ocena realizacji zadania [SU4] Ocena umiejętności korzystania z metod i narzędzi
[K7_U06] applies computer, statistical and specialised database methods to solve scientific and technological problems in technology and related fields	knows the basic IT and statistical methods and tools used in the analysis of scientific and technological data; has knowledge of specialist databases used in chemical technology and related fields (e.g. databases of chemical compounds, materials, experimental data); understands the importance of data processing and statistical modelling for solving research and technological problems.	[SU1] Ocena realizacji zadania [SU2] Ocena umiejętności analizy informacji
[K7_K01] critically evaluates the content of cognitive and practical problems	knows the principles of critical analysis of scientific and technical information; has knowledge of methods for assessing the reliability of sources, data and conclusions in the field of natural sciences and technology; understands the importance of a critical approach in solving research and practical problems.	[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce

Subject contents

Selecting the optimal analytical technique to solve a given problem. Methods of searching for and critically analyzing information on possible solutions. Practical aspects of applying various analytical techniques. International standards for the validation of analytical methods. Estimating the uncertainty budget.

1. Introductory classes (presentation of objectives, division into groups, selection of topics).

2. Preparation of presentations on: state of knowledge, analysis of requirements, proposed solutions.

3. Consultations on problems encountered.

4. Presentation of work progress and project results.

Prerequisites and co-requisites

Students should have:

1. Basic knowledge of analytical chemistry and chemical technology, including knowledge of analytical techniques and laboratory equipment.
2. The ability to operate basic laboratory equipment and conduct chemical experiments safely.
3. Knowledge of the basics of mathematics and statistics allowing for the analysis of experimental data.
4. The ability to use scientific literature and specialist sources, including those in English.

Additional requirements:

1. Basic experience in designing chemical or technological experiments.
2. Knowledge of modern IT tools supporting the analysis of experimental data.
3. Ability to work in a project team and communicate research results in written and oral form.
4. Interest in new analytical methods and innovations in chemical technology.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
project	60.0%	100.0%

Recommended reading	Basic literature	1. Z Witkiewicz, J. Hetper, Chromatografia gazowa, WN-T, Warszawa 2001. 2. Chromatografia cieczowa, [red.] M. Kamiński, CEEAM, Gdańsk 2004. 3. Spektrometria atomowa, [red.] E. Bulska, K. Pyrzyńska, Malmut, Warszawa 2007. 4. Z. Marczenko, Spektrofotometryczne oznaczanie pierwiastków, PWN, Warszawa 1979.
	Supplementary literature	P. Konieczka, J. Namieśnik, Quality Assurance and Quality Control in the Analytical Chemical Laboratory, CRC Press, London, 2018
	eResources addresses	Supplementary https://www.sciencedirect.com/ - Search engine for articles published by Elsevier https://www.googlescholar.com - Scientific literature search engine
Example issues/ example questions/ tasks being completed	1. Analysis of melatonin content in dietary supplements. 2. Analysis of vitamin D3 content in dietary supplements. 3. Synthetic sweeteners in food. 4. Ethyl alcohol in biocidal products. 5. Preservatives in cosmetics. 6. Biocides in wood protection products. 7. Nicotine content in e-cigarette liquids.	
Practical activites within the subject	Not applicable	

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