University of Gdańsk

Subject card

Subject name and code	Validation methods, PG_00054414		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	postgraduate 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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	1.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Analizy Związków Naturalnych -> Katedra Analizy Środowiska -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Marek Gołębiowski	
	Teachers	dr hab. Marek Gołębiowski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	15.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Additional information:
- Auditorium classes

- Presentation

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

1. Familiarize the students with the parameters subjected to validation,
2. Acquiring the knowledge about calculations necessary for the validation of analytical methods,
3. Acquiring the knowledge for choosing the right analytical technique,
4. Acquiring the skill of designing of experiments regarding the validation of analytical methods for analysis of selected analytes
5. Acquiring the skill to prepare a validation report for an analytical method

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_W06] Applies mathematics to the extent necessary to understand, describe and model chemical processes of medium complexity.	1. Demonstrates the skills to assess the parameters used to validation of analytical methods 2. Demonstrates the skills to determine the parameters used to validation of analytical methods 3. Evaluates the parameters used to validation of analytical methods	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[CHEMMU2_W09] Classifies specialist IT tools used in statistical evaluation of experiment results.	1. knows and describes the stages of the analysis in the interlaboratory comparisons 2. can calculate validation parameters of analytical methods 3. draws conclusions from the calculated validation parameters 4. Consciously evaluates the values of calculated validation parameters	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[CHEMMU2_W08] Demonstrates knowledge of theoretical computational and IT methods used to solve problems in chemistry.	1. knows and describes the parameters of the method subject to validation 2. can calculate validation parameters of analytical methods, 3. Evaluates the parameters used to validation of analytical methods 4. Consciously evaluates the values of calculated validation parameters	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report

Subject contents

Validation methods of the analytical procedure, validation parameters of the analytical methodology (precision, accuracy, linearity, measuring range, sensitivity, detection limit, quantification limit, specificity, selectivity, robustness, ruggednes, precision vs. accuracy, precision measures, repeatability, intermediate precision and reproducibility, comparison of the precision of two methods, comparison of the precision of several analytical methods, accuracy vs. trueness, accuracy measures, statistical conclusions on the basis of selected statistical tests, determination of the linearity, range and sensitivity methods on the basis of linear regression, determination of the linearity on the basis of detector response to concentration of analyte ratio, methods of determining the detection and quantification limit, verification of the specificity, selectivity, robustness and ruggednes). Calculation of the validation parameters. Presentation on the topic of validation methods.

Prerequisites and co-requisites

Basic knowledge and skills in statistics are required.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
60% points from the final test	51.0%	60.0%
25% points obtained from the partial test	51.0%	25.0%
15% from the presentation	51.0%	15.0%

Recommended reading

Basic literature	1. Konieczka P., J. Namieśnik i in.: Assessment and quality control of analytical results. Centrum Doskonałości Analityki i Monitoringu Środowiskowego, Gdańsk 2004. 2. Łomnicki A.: Introduction to statistics for naturalists. Wydawnictwo Naukowe PWN, Warszawa 2003 3. Czermiński J. B., A. Iwasiewicz i in.: Statistical methods for chemists. Wydawnictwo Naukowe PWN, Warszawa 1992.
Supplementary literature	1. Kabata-Pendias A., B. Szteke (red.): Problems of the quality of trace analysis in research on the natural environment. Wydawnictwo Zofii Dobkowskiej, Warszawa 1998. 2. Mazerski J.: Basics of chemometrics. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2000. 3. Dobosz M.: Computer-aided statistical data analysis. Akademicka Oficyna Wydawnicza EXIT, Warszawa 2001.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable