GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Chemometrics in environmental science, PG_00057790		
Field of study	Green Technologies		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	English
Semester of study	4	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Laskowski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	5.0	50.0	100

Subject objectives

Aim of this course is to familiarize Student with several most important chemometric techniques and their application in environmental monitoring & sciences.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U03] is able to use information and communication technologies relevant to the common tasks of engineering, is able to use known methods and mathematical-physical models to describe and explain phenomena and chemical processes	Student is able to use a spreadsheet and/or the basics of R programming language to solve a complex mathematical problem regarding multidimensional dataset.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_W01] has a basic knowledge from some branches of mathematics and physics useful for formulating and solving simple problems in the field of environmental technologies and modern analytical methods	A Student is familiar with advanced chemometric techniques and is able to properly choose proper techniques in order to solve a given scientific problem.	[SW1] Assessment of factual knowledge

Subject contents

1. Introduction to chemometrics & environmental sciences, data acquisition & documentation
2. Data control
3. Data processing, visual analysis
4. Analysis of similarities
5. Principal component analysis (PCA)
6. Classification, time series
7. Experiment planning, dependence modelling
8. Dependence modelling, part 2

Prerequisites and co-requisites

1. Basic knowledge of statistical terms & techniques.
2. Experience in usage of a spreadsheet.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	60.0%	50.0%
homework	60.0%	50.0%

Recommended reading

Basic literature	1. Practical Guide to Chemometrics, edited by Paul Gemperline, Taylor & Francis, 2006. 2. Statistics and Chemometrics for Analytical Chemistry, J.N. Miller & J.C.Miller, Pearson Education Limited, 2005.
Supplementary literature	- brak -
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	A Student will be asked to prepare an individual dataset, to state a problem for this dataset and to solve it on her/his own, using chemometrical techniques learned during the classes. Also, the lecturer will provide some additional datasets in order to practice additional techniques.
Work placement	Not applicable

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