



## Subject card

Subject name and code	Fundamentals of chemometry, PG_00050104						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Julia Borzyszkowska-Bukowska				
	Teachers		dr hab. inż. Tomasz Laskowski				
			dr inż. Julia Borzyszkowska-Bukowska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	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	30		2.0		18.0	50
Subject objectives	The aim of this course is to teach how to extract useful information from multidimensional datasets, using numerical and statistical approaches.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	Student is able to design and conduct measurements correctly and deal with the resulting data, according to the rules of chemometrics.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
	[K6_W02] knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study	Student is able to propose a chemometric problem on the basis of natural sciences and solve it.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	Student effectively uses chemometric techniques and selects them accordingly to a given problem, thoroughly uses the software designed to realize given goals and is able to write a simple script in a chosen programming language to process the data more effectively.	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
	[K6_W01] knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student learns selected chemometric techniques, including regression methods and advanced matrix operations.	[SW1] Assessment of factual knowledge
Subject contents	<ul style="list-style-type: none"><li>• Data control</li><li>• Analysis of single variables</li><li>• Analysis of variables in pairs</li><li>• Multidimensional analysis of variables</li><li>• Multidimensional analysis of samples</li><li>• Principal Component Analysis</li><li>• Dependence modelling</li><li>• Cluster analysis</li></ul>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	50.0%
	Exam	60.0%	50.0%
Recommended reading	Basic literature	Jan Mazerski, "Chemometria praktyczna", Malamut Press.	
	Supplementary literature	-	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Project, aiming at extraction of useful information from a mutlidimensioanl dataset, prepared by Student.		
Work placement	Not applicable		

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