



Subject card

Subject name and code	Sensing Materials, PG_00068251						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2029/2030	
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	4	Language of instruction				Polish	
Semester of study	7	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Radosław Pomećko					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	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		4.0		26.0	75
Subject objectives	Getting to know the different methods of determination the level and kinds of analytes using electrochemical sensors. Understanding the mechanisms that describe the operation of those sensors. The acquisition of practical ability in the construction and operation of chemical sensors. To acquaint students with the miniaturization of sensors and new materials to make them. Design of new technical solutions relating to the broad range of chemical sensors.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W10] knows and understands, to an advanced extent, the parameters, functions, and methods of analysis, design, and optimization of electronic circuits and systems, the definitions of error and measurement uncertainty, measurement methods, including time, frequency, and phase measurements, the properties of converters, and methods of digital signal processing, as well as the basic processes occurring in the life cycle of technical devices, objects, and systems, and methods of supporting processes and functions, specific to the field of study	The student is able to properly analyze assigned tasks and skillfully solve them using the available tools.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U52] can determine properties of materials and biomaterials used in biomedical engineering	Student has the knowledge to determine the key properties of applied sensor materials			[SU2] Assessment of ability to analyse information		
Subject contents	Course content – lecture <u>Classification of chemical sensors. Basics of molecular recognition.</u>						
Prerequisites and co-requisites	Basics of physical chemistry and electrochemistry						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical tasks	60.0%	30.0%
	Exam	55.0%	50.0%
	Project	60.0%	20.0%
Recommended reading	Basic literature	1. Z. Brzóska, W. Wróblewski: Sensory chemiczne, wyd. PW 1999  2. J. Wang: Analytical electrochemistry, J. Wiley&Sons, New Jersey 2006  3. Praca zbiorowa: Elektroanaliza w ochronie środowiska natur, pod red. R. Kalvody (tł. K. Sykut)  4. Materiały wykładowe	
	Supplementary literature	1. M. J. Sienko, R.A. Plane: Chemia, podstawy i własności, WN-T Warszawa 1980, 1-sze wyd. polskie 2. A. Kísza: Elektrochemia II, Elektrodyka, WN-T W-wa 2001 3. A. Sharma, K.R.Rogers: Biosensors, artykuł przeglądowy w Meas. Sci. Techno. 461-472 (1994)  4. Marek Blicharski, Inżynieria materiałowa, Wydawnictwo Naukowe PWN, WNT, Warszawa 2019 (wydanie IV)  5. Jan Pielichowski, Andrzej Puszyński, Chemia polimerów, Fosze, Rzeszów 2015	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Computational methods used in potentiometry 2. Knowledge of the structure and properties of ISE 3. Issues optimization 4. Review of biosensors for use in biomedical engineering 5. Construction and operation of optical sensors		
Practical activities within the subject	Not applicable		

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