



Subject card

Subject name and code	Sensors and Measurement Converters, PG_00053564						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject				2023/2024	
Education level	first-cycle studies	Subject group				Obligatory subject group in the field of study 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 Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Paweł Kalinowski				
	Teachers		mgr inż. Kamil Osiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		3.0		17.0	50
Subject objectives	Learning of students the basic issues in the non-electrical measurements						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum		Student - knows the structure and principle of operation of sensors and measuring transducers.		[SW1] Assessment of factual knowledge		
	[K6_W05] Knows and understands, to an advanced extent, methods of supporting processes and functions, specific to the field of study		Student - defines the basic issues in measurements, classifies of measurement methods		[SU4] Assessment of ability to use methods and tools [SK5] Assessment of ability to solve problems that arise in practice [SU1] Assessment of task fulfilment		
	[K6_U08] while identifying and formulating specifications of engineering tasks related to the field of study and solving these tasks, can:n- apply analytical, simulation and experimental methods,n- notice their systemic and non-technical aspects,n- make a preliminary economic assessment of suggested solutions and engineering work n		Student - can choose, using the technical specifications of devices, the appropriate measurement method and appropriate electronic components, including sensors and measuring transducers for a given problem		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	1. Basic concepts: measured quantity, measurement object, measuring transducer, measurement lines, measurement errors. 2. Measuring transducers, classification, metrological properties of sensors and their determination. 3. Dynamic properties of transducers. 4. Strain gauge measurements. 5. Inductive sensors. 6. Thermoresistors and thermocouples. 7. Optical pyrometry. 8. Ultrasonic measurements. 9. Measurements of rotational speed.						

Prerequisites and co-requisites	No requirements.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Execution of exercises and preparation of reports	50.0%	100.0%
Recommended reading	Basic literature	J. S. Wilson, Sensor Technology Handbook, Elsevier 2005.	
	Supplementary literature	J. S. Wilson, Sensor Technology Handbook, Elsevier 2005.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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