



Subject card

Subject name and code	Basics and systems of telemetry, PG_00053325						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
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. Grzegorz Jasiński					
	Teachers	dr inż. Grzegorz Jasiński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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		4.0		41.0	75
Subject objectives	The aim of the course is to familiarize students with the aspects of telemetry used in biomedical engineering. Both theoretical aspects and issues related to their practical use of biomedical telemetry systems will be presented.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of advanced technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	The student explains the meaning of the basic concepts related to biomedical telemetry. The student explains the basic differences between the various solutions. The student indicates and explains the basic conditions for the design and use of telemetry systems. The student selects the appropriate solutions and technologies depending on the application. The student builds and configures selected telemetry systems.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	The student indicates and explains the basic conditions for the design and use of telemetry systems in biomedical applications. The student selects, depending on the application, appropriate sensors, methods of communication and selects the appropriate power supply system. The student designs and configures a telemetry system that measures selected parameters. The student tests the operation of selected telemetry systems.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
	[K7_W06] Knows and understands, to an increased extent, the basic processes taking place in the life cycle of devices, facilities and technical systems.	The student explains the meaning of the basic concepts related to biomedical telemetry. The student explains the basic differences between the various solutions. The student selects the appropriate system for a given application.	[SW1] Assessment of factual knowledge
	[K7_W03] Knows and understands, to an increased 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.	The student indicates and explains the basic conditions for the design and use of telemetry systems in biomedical applications.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	The student selects, depending on the application, appropriate sensors, methods of communication and selects the appropriate power supply system. The student designs and configures a telemetry system that measures selected parameters. The student tests the operation of selected telemetry systems.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
Subject contents	Introduction to biomedical telemetry. The specificity of designing biomedical telemetry devices. Classification and principle of operation of sensors in biomedical telemetry devices. Examples of sensors in biomedical telemetry devices. Powering biomedical telemetry devices. Issues related to communication in biomedical telemetry devices. Inductive coupling. Optical biotelemetry. Technologies and communication standards for biosensors. Security and privacy in biomedical telemetry. Examples of biomedical telemetry devices.		
Prerequisites and co-requisites	There are no requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Preject	50.0%	30.0%
	Written exam	50.0%	70.0%
Recommended reading	Basic literature	Konstantina S. Nikita (Editor), Handbook of Biomedical Telemetry, Wiley-IEEE Press, 2014	
	Supplementary literature	Materials for the subject developed in the form of distance learning	
	eResources addresses	Adresy na platformie eNauzanie:	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable