

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electronical Medical Equipment II, PG_00053504							
Field of study	Biomedical Engineering							
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026			
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		1.0			
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. Tomasz Kocejko					
	Teachers		dr inż. Tomasz Kocejko					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	^{>} roject Semi		SUM
	Number of study hours	0.0	0.0	15.0	0.0		0.0	15
	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	15		2.0		10.0		27
Subject objectives	To familiarize students with the types and requirements for the medical equipment, especially electronic medical equipment.							

Learning outcomes	Course outcome	Subject outcome	Method of verification				
	[K6_W06] Knows and understands the basic processes occurring in the life cycle of devices, facilities and systems specific to a given field of study.	The student knows the requirements and standards for different classes of requirements for medical equipment, basic methods for solving engineering problems, ways to support vital functions, including the use of artificial organs and implants, knows the materials for their production and their properties	[SW1] Assessment of factual knowledge				
	[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 regulations dealing with medical devices -identyfies hazards associated with given type of medical device	[SW1] Assessment of factual knowledge				
	[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	The student knows the basic measurement methods used in medical, diagnostic techniques known physiological systems and principles of imaging techniques	[SW1] Assessment of factual knowledge				
	[K6_W54] Knows and understands, to an advanced extent, selected aspects of biomedical diagnostics	The student knows the basic measurement methods used in medical, diagnostic techniques known physiological systems and principles of imaging techniques	[SW1] Assessment of factual knowledge				
Subject contents	1 Characteristics of medical equipment (AM) and the conditions to be met by construction of such devices, 2 Basics safety considerations, 3 Sources of electrical signals and their biological characteristics, 4. Electrography and their design, 5. Cell's electrography, 6. ECG - electrodes and measuring systems, 7. Vectorcardiography, 8. Holter equipment and special, 9. Electromyography and plethysmography, 10. Fundamentals of EEG measurement, 11. Problems of electrographic signal analysis, 12. Electroimpedance measurements - ICG, 13. Biomechanical signals measurements, 14. Polygraphs and their applications, 15. Nerve and muscle stimulators, 16. Defibrillators, pacemakers and cardioverter, 17. Spirometry, 18. Audiometry, 19. Intensice Care Medicine, 20. Equipment and screening systems, 21. Apparatus Ultrasound - basics, 22. Ultrasound, 23. Methods of Doppler ultrasound technique, 24. Fundamentals of radiological measurements, 25. X-ray detectors, 26 The concept of tomographic measurements, tomographic scanners types, 28. Magnetography and its applications, 29 Overview of optical diagnostic methods, 30. Development trends in the design of medical equipment						
Prerequisites and co-requisites	Backgrounds of physics, mathematic	s and anatomy					
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	Exam	60.0%	100.0%				
Recommended reading	Basic literature	Materiały pomocnicze do wykładu i laboratorium, Gdańsk, 2010					
		M. Nałęcz (red.) Biocybernetyka i inzynieria Biomedyczna, t.2. Biopomiary, Exit, Warszawa, 2001					
		J. D. Bronzino [ed.], The Biomedical Engineering Handbook, CR					
	Laboratory instructions, KIBM-WETI						
	Supplementary literature	Enderle [red}, Introduction to biomedical engineering, Elsevier, 2005					
		Pawlicki G., Podstawy Inżynierii Medycznej, OWPW, Warszawa, 1997					
	eResources addresses Adresy na platformie eNauczanie:						
Example issues/ example questions/ tasks being completed	1. Describe factors determining a sat	fety of medical equipment?					

Work placement	Not applicable

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