

SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

Subject card

Subject name and code	Basics of Medical Devices Design , PG_00047846							
Field of study	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	6		ECTS credits		5.0			
Learning profile	general academic profile		Assessment form		exam			
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics							
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Jerzy Wtorek					
	Teachers		prof. dr hab. inż. Jerzy Wtorek					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0		0.0	60
	E-learning hours included: 0.0							
Learning activity and number of study hours	Learning activity	Participation i classes incluc plan	n didactic led in study	Jactic Participation in n study consultation hours		Self-study		SUM
	Number of study hours	60		5.0		60.0		125
Subject objectives	The aim of the course is to introduce students with basic problems inherit to designing electronic medical equipment							

Learning outcomes	Course outcome	Subject outcome	Method of verification				
	[K6_K01] is ready to cultivate and disseminate models of proper behaviour in and outside the work environment; make independent decisions; critically evaluate actions of their own, teams they lead and organisations they are part of; take responsibility for results of these actions; responsibly perform professional roles, including:n - observing rules of professional ethics and require it from others,n - care for the achievements and traditions of the professionn	The student understands the consequences of incorrect solutions in the construction of medical equipment	[SK5] Assessment of ability to solve problems that arise in practice				
	[K6_U10] can individually plan their own lifelong education, also by means of advanced information and communication technologies (ICT), and communicate with people from their environment, firmly justify their point of view, participate in debates, present, assess and discuss different opinions and points of view, as well as use specialist terminology related to the field of study in communication	Student performs designing tasks both individually and in cooperation with other team members according to schedule prepared and can present effects of work	[SK2] Assessment of progress of work [SK1] Assessment of group work skills [SK3] Assessment of ability to organize work				
	[K6_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	The student is able to choose the right solution for a specific technical problem.	[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	The student can choose the appropriate calculation method, including numerical one, to obtain the expected effect.	[SW3] Assessment of knowledge contained in written work and projects				
Subject contents	1 Computer aided design, CAD, CAM, 2 Types of medical equipment, 3 Safety Aspects, 4. Safety Classes, 5 Monitoring and measurement, 6 Requirements definition (end user, manufacturer, Functional, exploitation), 7. Elements of reliability of electronic devices, 8 Product definition, 9 Determinants design (environmental, production), 10. life cycle of the project, 11. Ecological Design, 12 Construction of a typical medical device, 13 Ways implementation of the application part, 14 Ways implementation signal barriers, 15 invasive and non-invasive measurements, 16 power, and security aspects, 17 Power Management, 18 Standards and requirements 19 EM Environment, 20. Disturbance characteristics, 21 Compatibility EM, 22 Compatibility Biological 23 Standards, 24 Software, 25 Real-time system, 26 Self-diagnosis, 27 software diagnostic methods, 28 IEEE 829-1998, 29. methods of equipment aging, 30 The certification						
Prerequisites and co-requisites	Electronic circuit, Digital circuits, Mic	rocontrollers					
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	Project	60.0%	40.0%				
	Lecture	60.0%	30.0%				
	Laboratory	60.0%	30.0%				
Recommended reading	Basic literature	Kisiel R., Bajera A., Podstawy konstrukcji urządzeń elektronicznych Norma PN-EN 60601					
	Supplementary literature	Biomedical Circuits and Systems, IE	nd Systems, IEEE Transactions on				
	eResources addresses Adresy na platformie eNauczanie:						
Example issues/ example questions/ tasks being completed	Design and develop an EOG measurement unit.						
Work placement	Not applicable						