



Subject card

Subject name and code	Designing of Printed Electronic Circuits, PG_00053421						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2023	Academic year of realisation of subject				2026/2027	
Education level	first-cycle studies	Subject group					
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 Electric Drives and Energy Conversion -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Blecharz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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		5.0		40.0	75
Subject objectives	The aim of the course is for students to acquire knowledge in the design and construction of printed electronic circuit boards (PCB) and skills enabling them to independently design and manufacture prototype electronic circuits and PCBs.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W06] knows the structure of computers and microprocessors and the tasks of operating systems, has basic knowledge of the basics of computer software, drivers, microprocessor technology, design of simple algorithms and the operation of information networks	Designing a prototype printed circuit board according to the adopted design assumptions.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U03] can prepare and present a presentation on the problems and results of an engineering task	Preparing fully functional design documentation for the construction of a prototype electronic system.			[SU1] Assessment of task fulfilment		
	[K6_W10] has basic knowledge related to mechatronics and robotics systems	Develops basic executive systems for use in complex mechatronic systems.			[SW1] Assessment of factual knowledge		
[K6_U01] can obtain information from literature, databases and other sources; integrate the information obtained, interpret it and draw conclusions, formulate and justify opinions	Selects electronic components based on the analysis of catalogue cards of electronic components manufacturers and engineering information provided by the R&D departments of electronics concerns.			[SU1] Assessment of task fulfilment			
Subject contents	<p>Course content – lecture LECTURE:</p> <p>Materials used in the construction of prototype electronic circuits. Overview of PCB design tools. Basic methods and principles of designing prototype boards. Materials and tools for PCB assembly. Rules for using technical documentation and engineering tips from the websites of electronic component manufacturers. Preparation of practical and functional design documentation.</p> <p>LAB:</p> <p>Independent development of an electronic system prototype design and complete technical documentation of a printed circuit board. Design, manufacture and commissioning of a prototype electronic device.</p>						

Prerequisites and co-requisites	Basic knowledge of electronics and power electronics is required.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	50.0%	80.0%
	Lecture	50.0%	20.0%
Recommended reading	Basic literature	Clyde F. Coombs; Happy Holden: Printed Circuits Handbook, Seventh Edition, 2016, McGraw-Hill Education 1. Hamilton, Charles. A guide to printed circuit board design. London Boston: Butterworths, 1984. Print.	
	Supplementary literature	<ol style="list-style-type: none"> 1. Felba J: Montaż w elektronice, Oficyna Wydawnicza Politechniki Wrocławskiej, 2010 2. D. Brooks: Signal Integrity Issues and Printed Circuit Board Design, Prentice Hall, 2003. 3. <i>The hitchhiker's guide to PCB design : things you wish you knew yesterday and will need to know tomorrow.</i> Rochester, NY: EMA Design Automation, Inc. 	
	eResources addresses	Basic https://www.pcdandf.com/pcdesign/ - A monthly magazine devoted to the design and production of printed circuit boards. https://www.bodospower.com/ - A monthly magazine describing news in the field of power electronics and electronics.	
Example issues/ example questions/ tasks being completed	Development of a project, execution, and commissioning of an electronic device. Students can choose from a list of proposals for electronic circuits. It is possible to implement individual designs of electronic systems solutions in consultation with the teacher. Stages of creating printed circuit designs. The most common design mistakes.		
Practical activities within the subject	Not applicable		

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