GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2022	Academic year of realisation of subject	2025/2026
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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Blecharz	
	Teachers		

Lesson types and methods of instruction

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_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_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_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

LECTURE:

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.

LAB:

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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Basic knowledge of electronics and power electronics is required.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture</td><td>50.0%</td><td>20.0%</td></tr>
<tr><td>Laboratory</td><td>50.0%</td><td>80.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">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.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">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. The hitchhiker's guide to PCB design : things you wish you knew yesterday and will need to know tomorrow. Rochester, NY: EMA Design Automation, Inc.</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Podstawowe
https://www.bodospower.com/ - A monthly magazine describing news in the field of power electronics and electronics.
https://www.pcdandf.com/pcdesign/ - A monthly magazine devoted to the design and production of printed circuit boards.
Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.