GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Industrial Electronics, PG_00038477		
Field of study	Electrical Engineering		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrical Engineering of Transport -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Leszek Jarzębowicz	
	Teachers	dr hab. inż. Jarosław Łuszcz dr hab. inż. Leszek Jarzębowicz	

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	10.0	10.0	50

Subject objectives

Learning about various solutions and technical conditions for the use of electronic devices in industrial environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U04	The student is able to select the required bandwidth of the transmission link for the 3D scanning system based on given technical parameters.	[SU2] Assessment of ability to analyse information
K7_W06	The student knows the transmission mechanisms of electromagnetic disturbances (EMC) in electronic systems and knows the technical means of reducing these disturbances.	[SW1] Assessment of factual knowledge

Subject contents

Fundamental mathematical relations. Printed circuit boards (PCBs). Fiber optic technology. Oscilloscope measurements. Interferences in electronic devices, selected practical issues. Servodrives. Intelligent transistor modules IPM and ASIPM. Microprocessor control of electronic devices. Systems for measuring position and angular velocity. Contactless electrical energy transfer systems. Energy harvesting systems. Industrial vision methods using laser triangulation.

Prerequisites and co-requisites

Basic knowledge of electrical engineering, electronics and control engineering.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final test	60.0%	70.0%
Reports and tests	60.0%	30.0%

Recommended reading	Basic literature	Mohan N.: Power Electronics. A First Course. John Wiley & Sons, Inc. 2012. Younkin G. W.: Industrial Servo Control Systems. Fundamentals and Application. Marcel Dekker 2003. Grzesiak L.M.: Sterowanie napędów i serwonapędów elektrycznych. Preskrypt. Politechnika Warszawska 2009. Web pages manufacturers of components and devices of industrial electronics.
	Supplementary literature	Wilamowski B. M., Irwin J. D.: The Industrial Electronics Handbook. Power electronIcs and motor drIves. CRC Press, Taylor and Francis Group, LLC, 2011. Tobin S. M.: DC Servos. Application and Design with MATLAB. Press, Taylor and Francis Group, LLC, 2011.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Discuss the principle of operation and the output waveforms of an incremental encoder. 2. Discuss the structure and the principle of operation of a vision system for three-dimensional scanning. 3. Discuss the technical means used to achieve high efficiency and high transmitted power in contactless electric energy transmission systems.	
Work placement	Not applicable	

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