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 2027	Academic year of realisation of subject	2027/2028
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	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrified Transportation -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Leszek Jarzębowicz	
	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	10.0	10.0	50

Subject objectives

Getting to know various solutions and technical conditions for the use of electronic devices in industrial environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W06] has an in-depth knowledge of industrial electronics, microprocessor control systems and in the field of power electronics and drive systems, their control and diagnostic methods	He/she describes the construction and principle of operation of angular position and velocity transducers used in electric drives.	[SW1] Assessment of factual knowledge
[K7_U04] is able to select industrial electronics equipment and prepare their software, design systems microprocessor systems	He/she designs a motion program code for electric servo drive.	[SU1] Assessment of task fulfilment

Subject contents

Course content – lecture

LECTURE: Optical fibers. Electromagnetic interferences in electronic devices. Electric servo drives. Intelligent power modules. Microprocessor-based control of electronic devices. Angular position and velocity measurement systems. Contactless electric power transmission systems. Industrial vision methods based on laser triangulation.

Course content – laboratory

LAB: Oscilloscope-based signal recording. Programming of the Control Techniques servo drive. Distance measurement in a distributed industrial system. Power electronic converters in installations with alternative energy sources. Transducers of force, acceleration and angular displacement. Servo drive - programming of motion parameters.

Prerequisites and co-requisites

Basic knowledge of: electrical engineering, electronics, power electronics, microprocessor systems.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lab raports and preparation verification	60.0%	30.0%
Lecture-part test	60.0%	70.0%

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. Czasopismo "IEEE Transactions of Industrial Electronics" (dostęp poprzez Bibliotekę PG)
	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. Grzesiak L.M.: Sterowanie napędów i serwonapędów elektrycznych. Preskrypt. Politechnika Warszawska 2009.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Discuss the operating principle and output waveforms of an incremental encoder. 2. Discuss the structure and operating principle of a vision system for three-dimensional scanning.	
Practical activites within the subject	Not applicable	

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