GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer-controlled Systems II, PG_00048423						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	February 2022		Academic year of realisation of subject		2022/2023		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study 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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Pazio				
	Teachers		dr inż. Marcin Pazio				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	15.0	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		4.0		16.0	50
Subject objectives	The aim of the course is to practice the skills to use computers for control with particular emphasis on practice in developing control software running in real time.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U07] can apply advanced methods of process and function support, specific to the field of study	Student describes and put to use in practice the basic components of a computer system. Student describes and put to use in practice interfaces connecting computer system with controlled plant. Student describes and put to use in practice multiprocessor systems. Student describes and put to use in practice different types of interfaces and communication protocols. Student describes and knows how to use micro-controllers to control. Student describes and knows how to use it in practice some techniques for creating software for control systems. Student describes and put to use in practice real-time operating systems.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work
[K7_U08] while identifying and formulating engineering tasks specifications and solving these tasks, can:n- apply analytical, simulation and experimental methods,n- notice their systemic and non-technical aspects,n- make a preliminary economic assessment of suggested solutions and engineering workn	Student describes and put to use in practice the basic components of a computer system. Student describes and put to use in practice interfaces connecting computer system with controlled plant. Student describes and put to use in practice multiprocessor systems. Student describes and put to use in practice different types of interfaces and communication protocols. Student describes and knows how to use micro-controllers to control. Student describes and knows how to use it in practice some techniques for creating software for control systems. Student describes and put to use in practice real-time operating systems.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work
[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Student can think systemically, can design, execute, and program a computer-controlled control system. He is able to diagnose it and assess the quality of the constructed system.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
[K7_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret obtained results and draw conclusions	Student is able to plan a series of tests of the control system, can carry out appropriate experiments and can draw conclusions from them both qualitative and quantitative.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions	Student is able to plan a series of tests of the control system, can carry out appropriate experiments and can draw conclusions from them both qualitative and quantitative.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>The course includes 6 individual projects and their laboratory implementation. The topics:

- The use of PLC and visualization system for controlling and monitoring the status of the elevator model

- Job analysis and tuning digital servo

- Usage of a PC computer and MatLab package for controlling the dynamic object as a model of the tethered helicopter

- Use of C language and the PC to control the plant in real time

- Use of assembly language, and a microcontroller to control the plant in real time

- Usage of a PC computer for controlling the work stand which consists of the manipulator, and the measuring system and the transport</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Documentation of completed projects</td><td>51.0%</td><td>40.0%</td></tr>
<tr><td>Implementation of the project</td><td>51.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Misiurewicz P. Podstawy techniki mikroprocesorowej. WNT 1991. Katalogi, strony WWW i podręczniki firmowe. Misiurewicz P. Układy mikroprocesorowe struktury i programowanie. WNT 1983. Niederliński A. Mikroprocesory mikrokomputery mikrosystemy. WSiP 1988. B. Zieliński, Układy mikroprocesorowe. Przykłady rozwiązań, Helion 2002 N. Noam, S. Shimon Elementy systemów komputerowych. Budowa nowoczesnego komputera od podstaw., WNT 2008 B. Danowski, Leksykon pojęć sprzętowych, Helion 2005 Metzger P. "Anatomia PC", HELION, 2008. Rydzewski A. "Mikrokomputery jednoukładowe rodziny MCS-51", WNT Warszawa 1992. Mielczarek W. "Szeregowe interfejsy cyfrowe", HELION, 1993.</td></tr>
<tr><td>Supplementary literature</td><td>Internet resorces</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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