



Subject card

Subject name and code	Computer-controlled Systems II, PG_00047430						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
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	2	Language of instruction			English		
Semester of study	3	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. Paweł Raczyński					
	Teachers	dr inż. Paweł Raczyński					
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_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.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
	[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.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[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.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[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.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[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.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice

Subject contents	<p>The course includes 6 individual projects and their laboratory implementation. The topics:</p> <ul style="list-style-type: none"> - 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 											
Prerequisites and co-requisites	No requirements											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Implementation of the project</td> <td>51.0%</td> <td>60.0%</td> </tr> <tr> <td>Documentation of completed projects</td> <td>51.0%</td> <td>40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Implementation of the project	51.0%	60.0%	Documentation of completed projects	51.0%	40.0%
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Recommended reading	Basic literature	<p>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 jednocukładowe rodziny MCS-51", WNT Warszawa 1992. Mielczarek W. "Szeregowe interfejsy cyfrowe", HELION, 1993.</p>										
	Supplementary literature	Internet resources										
	eResources addresses	<p>Adresy na platformie eNauczanie: Computer Controlled Systems Lab - 2023/2024 - Moodle ID: 29090 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29090</p>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											