



Subject card

Subject name and code	Real-time Operating Systems - Seminar, PG_00047462						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2022/2023		
Education level	second-cycle studies		Subject group		Optional subject group 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		English		
Semester of study	1		ECTS credits		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Automatic Control -> 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	0.0	0.0	15.0	15
	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	15		2.0		8.0	25
Subject objectives	The aim of the course is to acquaint students with architecture of a real-time operating systems and mechanisms available to users/programmers in a RTOS environment.						
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 knows how to put into practice the basic distributed computing technologies. Student describes and knows how to put into practice the basic techniques used in computer networks.		[SK1] Assessment of group work skills [SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information		
	[K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions		The student describes the multithreaded programming techniques and know how to use them in practice. Student describes and knows how to put into practice the techniques of synchronization and task interaction .		[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SK4] Assessment of communication skills, including language correctness		
	[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 knows how to apply in practice the techniques of management of the computer system resources.		[SK1] Assessment of group work skills [SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information		
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems		Student describes and knows how to assess the suitability of various mechanisms offered by operating systems to solve practical problems.		[SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness		

Subject contents	1. Licenensing models of the RTOS software. Legal issues with examples. 2. Threats arising from the system/software errors. Case studies. 3. RT versions of Linux. 4. The QNX System. Structure and applications. 5. RT systems for microcontrollers. 6. The ECOS System. Structure and applications. 7. The RTEMS System. Structure and applications. 8. The VXWORKS System. Structure and applications. 9. Android, IOS and Windows Phone. Technical aspects comparison.		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	30.0%
	Presentation at the seminar	50.0%	70.0%
Recommended reading	Basic literature	Jędrzej Ułasiewicz "Systemy czasu rzeczywistego QNX6 NEUTRINO", Wydawnictwo btc, 2007 William Stallings "Systemy operacyjne, struktura i zasady budowy", Wydawnictwo Naukowe PWN, 2006 Krzysztof Stencel "Systemy operacyjne", Wydawnictwo PJWSTK, 2004 Internet resources of a system vendors.	
	Supplementary literature	J. W. S. Liu, „Real – time systems.”, Prentice Hall, 2000. R. Williams, „Real – time systems development.”, BH/Elsevier 2006.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Presentations discussing subject-related issues.		
Work placement	Not applicable		