

## § GDAŃSK UNIVERSITY § OF TECHNOLOGY

## Subject card

Subject name and code	Embedded Systems in Automatic Control and Robotics, PG_00049435								
Field of study	Automatic Control, Cybernetics and Robotics								
Date of commencement of studies	October 2024		Academic year of realisation of subject			2026/2027			
Education level	first-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	3		Language of instruction			Polish			
Semester of study	6		ECTS credits			2.0			
Learning profile	general academic profile		Assessment form		assessment				
Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics								
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Tomasz Stefański						
	Teachers	dr hab. inż. Tomasz Stefański							
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 i classes incluc plan		Participation in consultation hours		Self-study		SUM	
	Number of study hours	30		2.0		18.0		50	
Subject objectives	Presenting students modern embedded systems used in automation and robotics.								

PRC_VMS1 process and use fair, the principles, methods and the principles of principles of designing embedded setter, the principles of the principles of the principles of designing embedded principles of the principles of	Learning outcomes	Course outcome	Subject outcome	Method of verification					
Subject contents     1. The genesis of embedded systems as a field based on computer science and automation 2. Hardware and traction in software and traction in the content of systems specific bits of an and the content of systems specific bits of a content of the curriculum       Subject contents     1. The genesis of embedded systems as a field based on computer science and automation 2. Hardware and traction in the curriculum     SW1] Assessment of facility of the curriculum       Subject contents     1. The student is able to design according to the field of study, using suitable the methods, techniques, tools and norms, applying technologies specific to the field of study, using suitable and materials, following engineering standards and norms, applying technologies specific to the field of study, using suitable and the student knows the antitecture of embedded systems as a field based on computer science and automation 2. Hardware and functional structure of computer control systems, classification and characteristics of basic structure, and the curriculum       Subject contents     1. The genesis of embedded systems as a field based on computer science and automation 2. Hardware and functional structure of computer control systems, classification and characteristics of basic structure, and the curriculum       Subject contents     1. The genesis of embedded systems as a field based on computer science and automation 2. Hardware and functional structure of computer control systems, classification and characteristics of basic structure, and the curriculum       Recommended reading     1. The genesis of embedded systems are aligned based on computer science and automation 2. Hardware and functional structure of computer control systems, classificat		understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such	principles of designing embedded						
Irequired specifications, and make a simple 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 technicologies specific to the field of study and experience gained in the professional engineering environment   The student knows the architecture of embedded systems   [SW1] Assessment of factual knowledge     IVE 0.00000000000000000000000000000000000		programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of		fulfilment [SU4] Assessment of ability to					
inderstands, to an advanced extert, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum   architecture of embedded systems calculated and curriculum     Subject contents   1. The genesis of embedded systems as a field based on computer science and automation.2. Hardware and functional structure of computer control systems, classification and characteristics of basic structures, hardware requirements for interrupts, memory and 1/0 channels.3. Computers, microcontrolies and PPGAs.4. ARM processor family. Multiple-Processor Systems of ARM processor family. Multiple-Processor Systems, classification and characteristics or basic structures, hardware requirements for interrupts, memory and 1/0 channels.3. Computers, microcontrolies and PPGAs.4. ARM processor family. Multiple-Processor Systems Compating systems used in the EDEE 802.16.4 standard 9. Real-time systems in distributed measurement systems, intelligent buildings, hospitals, etc.     Prerequisites   Subject passing criteria   Passing threshold   Percentage of the final grade     Assessment methods and criteria   Subject passing criteria   Passing threshold   Percentage of the final grade     Recommended reading   Basic literature   1. Dorft R.C., Bishop R.H. Modern control systems, Addison Wesley, 1995   1. Marwedel P. Embedded Systems Son 2003, ISBN 1.4020-7690-8   3. Obision G., Piani G., Computer systems in automation, Prentice-Hail, Loodyn New York 1992     Recommended reading   Supplementary literature   No requirements		required specifications, and make a simple 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	, °	fulfilment [SU4] Assessment of ability to					
and functional structure of computer control systems, classification and characteristics of basic structures, hardware requirements for interrupts, memory and 1/0 channels. Computers, microcontrollers and FPGAs.4. ARM processor family. Multiple-Processor System on Chip (MPSoC).5. Support for peripheral devices.6. Embedded systems software on the example of ARM processors.7. Operating systems used in embedded systems: IACAN networks and the ZigBee wireless network in accordance with the IEEE 802.15.4 standard.9. Real-time systems.10. Applications of embedded systems in distributed measurement systems, intelligent buildings, hospitals, etc.     Prerequisites   and co-requisites     Assessment methods and criteria   Subject passing criteria   Passing threshold   Percentage of the final grade     Project assignments   50.0%   60.0%   60.0%     Final test   50.0%   40.0%   80.0%     Recommended reading   Basic literature   1. Dorf R.C., Bishop R.H. Modern control systems, Addison Wesley, 1995     2.   Marwedel P., Embedded System Design, Kluwer Academic Publishers, Boston 2003, ISBN 1-4020-7690-8   3. Olsson G., Computer systems in automation, Prentice-Hall, Londyn New York 1992     4.   Tide_averages   Adresy na platformie eNauczanie:     Example issues/   1.   Real-time sound filtration system on the evaluation board.     2.   LED control.   3. Control of the liquid crystal display.		understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues -							
and co-requisites     Assessment methods and criteria   Subject passing criteria   Passing threshold   Percentage of the final grade     Project assignments   50.0%   60.0%     Final test   50.0%   40.0%     Recommended reading   Basic literature   1. Dorf R.C., Bishop R.H. Modern control systems, Addison Wesley, 1995     Recommended reading   Basic literature   1. Dorf R.C., Bishop R.H. Modern control systems, Addison Wesley, 1995     Subject passing criteria   Marwedel P., Embedded System Design, Kluwer Academic Publishers, Boston 2003, ISBN 1-4020-7690-8     Supplementary literature   Norequirements     Publ.   Soton C., Piani G., Computer systems in automation, Prentice- Hall, Londyn New York 1992     Ting-pat So A., Intelligent building systems, Kluwer Academic Publ., Boston London 1999     Supplementary literature   No requirements     eResources addresses   Adresy na platformie eNauczanie:     1. Real-time sound filtration system on the evaluation board.   2. LED control.     2. LED control.   Control of the liquid crystal display.		and functional structure of computer control systems, classification and characteristics of basic structures, hardware requirements for interrupts, memory and I / O channels.3. Computers, microcontrollers and FPGAs.4. ARM processor family. Multiple-Processor System on Chip (MPSoC).5. Support for peripheral devices.6. Embedded systems software on the example of ARM processors.7. Operating systems used in embedded systems.8. Communication interfaces in embedded systems: HART, ASI and CAN networks and the ZigBee wireless network in accordance with the IEEE 802.15.4 standard.9. Real-time systems.10.							
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	example questions/	2. LED control.							
	Work placement	Not applicable							