GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Technologies of Embedded Real-time Systems, PG_00049434						
Field of study	Electronics and Telecommunications						
Date of commencement of studies	October 2023		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	4		Language of instruction	Polish			
Semester of study	7		ECTS credits	2.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Signals and Systems -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Lech Kilian					
	Teachers	dr inż. Lech Kilian					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	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		2.0	18.0	50	
Subject objectives	The aim of the course is to familiarize students with the technological aspects of designing systems and analog and digital devices, i.e. standardization of dimensions and housings, power supply problems, minimization noises, exposure resistance, PCB designing.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] knows and 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 devices	Student presents the method of connecting the processor with the environment and procedures limiting noise in the cooperation of digital and analog circuits in the designed device.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
[K6_U03] can design, according to 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 environment	Student presents the project of small electronic device, resistant to specific exposures and noise, along with the PCB and housing.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K6_U04] can apply knowledge of 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 study	Student embeds and tests the acquired software on the processor - the equivalent of the processor embedded in the project.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K6_W03] knows and 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 - appropriate for the curriculum	Student designs a schematic diagram of a simple circuit with embedded processor and the environment.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation

Subject contents

1.Organizational matters: credit rules, consultations, literature
2. Introduction - specificity of real-time systems in relation to their work environment
3. Rules for marking system components
4. Equipment classification
5. Housings
6. Counteracting noises
7. Electronic circuits surrounded by embedded processors
8. Printed circuit boards PCB
9. Summary

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	30.0%
	60.0%	70.0%

Recommended reading	Basic literature	1. L. Hasse, F. Kołodziejski, A. Konczakowska, L. Spiralski Zakłócenia w aparaturze elektronicznej. Radioelektronik Warszawa 1995 2. S. Okoniewski Podstawy konstrukcji. WNT Warszawa 1969 S. 3. Okoniewski Podstawy technologii mechanicznej. WNT Warszawa 1967 4. R. Salamon Systemy hydroloakacyjne. GTN Gdańsk 2006 5. L. Kilian Materiały pomocnicze do przedmiotu.
	Supplementary literature	Nie dotyczy
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Typical enclosures. 2. Sources of noise in analogue-digital systems 3. Preventing amplifier excitation 4. Linear, logarithmic, exponential amplifiers	
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.