

## COURSE DESCRIPTION CARD

Bialystok University of Technology										
Field of study	Electrical and Electronics Engineering							Degree level and programme type	Bachelor's degree	
Specialization/ diploma path	-							Study profile	-	
Course name	Local Communication Interfaces							Course code	IS-FEE-10074S	
								Course type	elective	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer	
	15		30					No. of ECTS credits	5	
Entry requirements	-									
Course objectives	Teaching a variety of problems related to contemporary digital systems based on micro-controllers and FPGA devices. Student will explain principles of operation of a variety of digital subsystems related to industrial digital systems and will understand basics of local communications interfaces and rules of the data exchange.									
Course content	<p><u>Lecture:</u> Topics address electrical principles, semiconductor and integrated circuits, local communication in microcomputer systems based on microcontrollers and FPGA devices, parallel and serial interfaces for local communication.</p> <p><u>Laboratory classes:</u> Practical exercises in programming and designing digital systems based on microcontrollers and FPGA and using parallel and serial interfaces for local communication..</p>									
Teaching methods	Lecture, laboratory classes, individual consultations									
Assessment method	Lecture – set of reports Laboratory classes– set of exercises and reports									
Symbol of learning outcome	Learning outcomes								Reference to the learning outcomes for the field of study	
L01	Student recognizes and understands wiring diagrams related to digital systems and local communication									
L02	Student identifies various data buses and interfaces from the wiring diagrams									
L03	Student determines function and operation of the various modules and sensors and has a good knowledge of how they are used in the management of the digital system									
L04	Student distinguishes between various functions that are									

	<b>part of an industrial digital system</b>	
<b>L05</b>	<b>Student uses suitable programming tools</b>	
<b>L06</b>	<b>Student uses application notes and data sheets</b>	
<b>Symbol of learning outcome</b>	<b>Methods of assessing the learning outcomes</b>	<b>Type of tuition during which the outcome is assessed</b>
<b>L01</b>	<b>written report on lecture content</b>	<b>L</b>
<b>L02</b>	<b>written report on lecture content</b>	<b>L</b>
<b>L03</b>	<b>written report on lecture content</b>	<b>L</b>
<b>L04</b>	<b>written report on lecture content</b>	<b>L</b>
<b>L05</b>	<b>evaluating the student's laboratory reports</b>	<b>LC</b>
<b>L06</b>	<b>evaluating the student's laboratory reports</b>	<b>LC</b>
<b>Student workload (in hours)</b>		<b>No. of hours</b>
<b>Calculation</b>	lecture attendance	<b>15</b>
	participation in laboratory classes.	<b>30</b>
	preparation of reports related to the lecture	<b>30</b>
	preparation for a written test related to the classes, laboratory classes etc.	<b>15</b>
	reports preparation related to the laboratory classes.	<b>30</b>
	participation in student-teacher sessions related to the lecture and laboratory classes.	<b>10</b>
	<b>TOTAL:</b>	<b>130</b>
<b>Quantitative indicators</b>		<b>HOURS</b>
		<b>No. of ECTS credits</b>
<b>Student workload – activities that require direct teacher participation</b>		<b>55</b>
<b>Student workload – practical activities</b>		<b>90</b>
<b>Basic references</b>	1. Ronald J. Tocci: Digital Systems: Principles and Applications, 2014. 2. William J. Dally: Digital Design: A Systems Approach, 2012. 3. Elliot Williams: AVR Programming: Learning to Write Software for Hardware, 2014. 4. Donzellini, G., Oneto, L., Ponta, D., Anguita, D.: Introduction to Digital Systems Design, Springer, 2019. 5. Joseph Yiu: The Definitive Guide to ARM® Cortex®-M3 and Cortex®-M4 Processors, 2014.	
<b>Supplementary references</b>	1. Barrett S.: Embedded Systems Design with the Atmel AVR Microcontroller, Morgan & Claypool Publishers, 2009. 2. Barrett S.: Atmel AVR Microcontroller Primer: Programming and Interfacing, Morgan & Claypool Publishers, 2007. 3. AgusKurniawan: Getting Started With STM32 Nucleo Development, 2015.	
<b>Organisational unit conducting the course</b>	<b>Department of Control Engineering and Robotics</b>	<b>Date of issuing the programme</b>
<b>Author of the programme</b>	<b>Wojciech Wojtkowski, Ph.D.</b>	<b>26.02.2021</b>

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar