

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: COMPUTER SYSTEMS INTERFACES		2. Course code: CSI		
3. Validity of course description: 2015/2016				
4. Level of studies: BSc programme				
5. Mode of studies: intramural studies				
6. Field of study: INFORMATICS		AEI		
7. Profile of studies: COMPUTER SCIENCE				
8. Programme:				
9. Semester: 5,6				
10. Faculty teaching the course: Institute of Informatics, RAu2				
11. Course instructor: dr inż. Wojciech Mielczarek				
12. Course classification:				
13. Course status: required				
14. Language of instruction: English				
15. Pre-requisite qualifications: circuit theory, operating systems, embedded systems, programming in C				
16. Course objectives:				
<p>The course presents evolution of computer interfaces as new types of peripherals were introduced. The first part explains legacy interfaces like UART and parallel port, the second contemporary "system ports": USB, IEEE 1394 (FireWire), Bluetooth and BLE . IEEE-488 (GPIB) interface and SCPI language are also covered, as well as problems connected with data acquisition. The special topic included is system protection against noises.</p> <p>The course gives students familiarity with the following topics:</p> <ul style="list-style-type: none">- standard and specialised computer systems interfaces used for communication with the peripheral devices,- software aspects of communication with peripherals,- selected examples of peripherals,- good practices of communicating with pripheral equipment (including protection against noise).				
17. Description of learning outcomes:				
Nb.	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Understanding fundamentals of communication in a computer system	Final test	Lecture	K1A_W12
2.	Knowledge on RS-232, RS-422, RS-485 ports. Knowledge on USB, FireWire, Bluetooth and BLE architecture.	Final test	Lecture	K1A_W08;K1A_W12
3.	Knowledge on IEEE-488 bus and controlling of SCPI compatible devices	Final test	Lecture	K1A_W06
4.	Skills for setting the com port parameters, controlling transmission on com port, managing communication on MODBUS.	Laboratory exercise	Laboratory, project	K1A_U13;K1A_U29
5.	Understanding, configuring, and managing communication on system ports like USB, IEEE-1394a, Bluetooth	Laboratory exercise	Laboratory	K1A_U05;K1A_U21; K1A_U30;K1A_U31
6.	Skills for controlling peripheral devices compatible with SCPI standard	Laboratory exercise	Laboratory	K1A_U21;K1A_U31
18. Teaching modes and hours				
Lecture: 30 h				
Laboratory: 15 h				
19. Syllabus description:				
Lectures:				
– Interfaces in the legacy computer systems: RS-232 and SPP (EPP, ECP).				
– Serial port expansion: RS-423A, RS-422A, RS-485 interfaces				

- Fieldbuses based on serial, asynchronous transmission and RS-232 switches or RS-485 bus.
- USB system architecture. (USB 2.0, USB 3.1 Gen1.)
- IEEE 1394a (FireWire) system architecture.
- Bluetooth and Bluetooth Low Energy architecture.
- IEEE-488 (GPIB) interface; controlling the instruments in SCPI language.
- Protection of data transmission circuits against noises.

Labs:

- RS-232 serial port; the fieldbus based on RS-485 and MODBUS protocol; controlling the communication system based on multiports RS-232 switches
- USB 2.0 – Universal Serial Bus
- USB 3.1 device embedded software, USB 3.1 Gen 1 driver in Linux
- FireWire (IEEE1394a) – managing and communication
- Wireless Bluetooth and BLE systems
- (IEEE-488 (GPIB) interface; controlling the SCPI instruments

20. Examination: none

21. Primary sources:

1. Anderson D.: Universal Bus System Architecture, Addison-Wesley Developers Press, 1997 by MindShare, Inc.
2. Anderson D.: FireWire System Architecture: IEEE 1394a, 2nd ed. Addison-Wesley Developers Press, 1998 by MindShare, Inc.
3. Bray J., Sturman Ch.: Bluetooth 1.1 Connect Without Cables, 2nd ed., Prentice Hall PTR 2002

22. Secondary sources:

W. Mielczarek: *Szeregowe interfejsy cyfrowe*, Helion 1993
 W. Mielczarek: *USB – Uniwersalny interfejs szeregowy*, Helion 2006
 W. Mielczarek: *Szeregowy interfejs cyfrowy FireWire, Standardy IEEE 1394, IEEE 1394a*, Wydawnictwo Politechniki Śląskiej, Gliwice 2010
 W. Mielczarek: *Tłumienie zakłóceń i ochrona informacji w systemach pomiarowych*, Wydawnictwo Politechniki Śląskiej, skrypt nr 1921, Gliwice 1995
 W. Mielczarek: *Urządzenia pomiarowe i systemy kompatybilne ze standardem SCPI*, Helion 1999
 W. Mielczarek: *Komputerowe systemy pomiarowe, Standardy IEEE-488.2 i SCPI*, Wydawnictwo Politechniki Śląskiej, Gliwice 2002
 D.Caban, W.Mielczarek, R.Pawłowski: *Komputerowe systemy pomiarowe, ćwiczenia laboratoryjne*, Wydawnictwo Politechniki Śląskiej, Gliwice 2004

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/15
2	Classes	15/15
3	Laboratory	/
4	Project	/
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	45/30

24. Total hours: 75

25. Number of ECTS credits: 2

26. Number of ECTS credits allocated for contact hours: 1

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 1

26. Comments:

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)