

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: STM32 family ARM microcontrollers programming		2. Course code STMP		
3. Validity of course description: 2013/2014				
4. Level of studies: BSc programme / MSc programme				
5. Mode of studies: intramural studies				
6. Field of study: MACROFACULTY		AEI		
7. Profile of studies:				
8. Programme:				
9. Semester: 6				
10. Faculty teaching the course: Institute of Electronics (RAu3)				
11. Course instructor: Damian Grzechca, Tomasz Golonek				
12. Course classification:				
13. Course status: elective				
14. Language of instruction: English				
15. Pre-requisite qualifications: A student has a basic knowledge in C/C++ programming and fundamental concepts of microprocessor systems.				
16. Course objectives: The aim of the course is to introduce students to STM32 family ARM microcontrollers programming with the use of JTAG interface and utilization of the standard library functions which support the microcontroller peripherals.				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	A student has knowledge of the structure and architecture of the STM microcontroller	Individual task	Laboratory	
2.	A student knows graphical environment for programming STM systems	Individual task	Laboratory	
3.	A student is familiar with basic library functions	Individual task	Laboratory	
4.	A student is able to configure basic blocks of the STM32 microcontroller	Individual task	Laboratory	
5.	A student can write program memory of the STM32	Individual task	Laboratory	
6.				
7.				
8.				
18. Teaching modes and hours Laboratory: 30				
19. Syllabus description: Laboratory: 1. Description of the STM32 system specification: Software Development Environment and Standard Peripheral Library. 2. Configuration of clock signals for the microcontroller. GPIO port communication. 3. Control of alphanumeric LCD display. 4. UART interface communication, interrupts handling. 5. Configuration and use of counters ("Timer"). 6. Use of A/D converter. 7. Use of D/A converter.				

- 8. DMA data transfer.
- 9. SPI interface communication.
- 10. I2C interface communication.
- 11. 1-wire network communication standard.
- 12. SD memory card operations.

20. Examination: No

21. Primary sources:

- 1. Krzysztof Paprocki, „Mikrokontrolery STM32 w praktyce”, Wydawnictwo BTC, 2011.
- 2. Marek Galewski, „STM32 Aplikacje i ćwiczenia w języku C”, Wydawnictwo BTC, 2012.
- 3. Reference manual RM0008:
http://www.st.com/internet/com/TECHNICAL_RESOURCES/TECHNICAL_LITERATURE/REFERENCE_MANUAL/CD00171190.pdf
- 4. Jonathan W. Valvano, Embedded Systems: Real-Time Interfacing to Arm® Cortex(TM)-M Microcontrollers, CreateSpace Independent Publishing Platform (November 10, 2011)
- 5. <http://www.hitex.com/fileadmin/pdf/insiders-guides/stm32/isg-stm32-v18d-scr.pdf>

22. Secondary sources:

Marcin Peczarski, „Mikrokontrolery STM32 w sieci Ethernet w przykładach”, Wydawnictwo BTC, 2011.

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode:	Contact hours / Student workload hours
1	Lecture	0/0
2	Classes	0/0
3	Laboratory	30/15
4	Project	0/0
5	BA/ MA Seminar	0/0
6	Other	10/5
	Total number of hours	40/20

24. Total hours:60

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): 2

28. Comments:

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)