

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Microprocessor technology		Code 1010332421010331118
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 2
Elective path/specialty Safety of Computer Systems	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: - Laboratory: 2 Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 4 100%
Responsible for subject / lecturer: dr inż. Krzysztof Walas email: krzysztof.walas@put.poznan.pl tel. 61 665 2809 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge from microprocessor technology, electronics and digital circuits. Acquaintance with programming in C and assembler.
2	Skills	Skills in programming in C and assembler and ability to compile and link programs.
3	Social competencies	Has a competency to work in a team and to solve the problems seen for the first time.
Assumptions and objectives of the course: To master the theoretical and practical skills connected to design, building and usage of microprocessor systems.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. has a deeper knowledge in the scope of the microprocessor technology - [K_W04]		
Skills:		
1. is able to gather the knowledge from literature, databases and other sources; is able to integrate obtained information and to interpret it to give the critical assessment; is able to draw conclusions and to justify thoroughly justify own opinion. - [K_U01]		
Social competencies:		
1. is able to think in creative and entrepreneurial way - [K_K01]		
Assessment methods of study outcomes		
Written examination, tests written/oral, projects.		
Course description		

<p>Lecture: Learning new designs of processors and microprocessors ? comparison of RISC and CISC architectures. Survey of operating systems for the ARM architecture computer processors family. Description of microprocessor peripherals and communication interfaces. Examples of mobile, information science and robotics applications: based on ARM processors.</p> <p>Lab: Introduction to structure of microprocessors based on ARM architecture. Usage of basic programming tools for C and assembler language. Writing computer programs for handling with microprocessor peripherals (I/O ports, D/A converter). Programming the communication interfaces between microprocessor and sensors (I2C, SPI, RS-232). Multithread and network programming (TCP/IP). Interfacing selected robotic sensors (Laser Scanner, Inertial Measurements Unit, RGB-D camera).</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Bryndza L.: Mikrokontrolery z rdzeniem ARM9 w przykładach, BTC Legionowo 2009r. 2. Prat S. Język C. Szkoła programowania, Wydanie V, Helion 2006. 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Upton E., Halfacree G.: Raspberry Pi User Guide, John Wiley & Sons Ltd The Atrium Chichester, 2012 2. Nota katalogowa BCM2835 3. Internet 		
<p>Result of average student's workload</p>		
<p>Activity</p>	<p>Time (working hours)</p>	
1. Wykłady	15	
2. Zaj. Lab.	30	
3. Konsultacje	5	
4. Przygotowanie się do zaj. lab.	30	
5. Sprawozdania z zaj. lab.	15	
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	100	4
Contact hours	50	2
Practical activities	75	3