

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Basics of microprocessor engineering		Code 1010331441010322695
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 4
Elective path/specialty -	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: - Laboratory: - Project/seminars: 2		No. of credits 3
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 Technical sciences		ECTS distribution (number and %) 3 100% 3 100%
Responsible for subject / lecturer: Prof. dr hab. inż. Konrad Skowronek email: konrad.skowronek@put.poznan.pl tel. 616652388 Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Rudimentary knowledge in mathematics, physics, bases of electrotechnology and electronics, in it digital.
2	Skills	Ability of understanding and interpreting the knowledge handed over on classes. Ability of the effective self-education in the field associated with chosen subject
3	Social competencies	Awareness of the need to expand its competence, readiness to undertake the cooperation in frames of the team.
Assumptions and objectives of the course: Profound cognition theoretical of both the practical problems associated with the structure of elements, sub-assemblies and microprocessor systems and bases of their programming and the design.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has a basic knowledge in mathematics, including algebra, analysis, logic, probability calculus and elements of discreet and applied mathematics. - [K_W02++]		
2. Has a knowledge tidied up and underpinned theoretically in analogue and digital electronic systems and programmable arrangements. - [K_W03+++]		
3. Has a knowledge tidied up and underpinned theoretically in the microprocessor engineering and embedded systems. - [K_W16+++]		
Skills:		
1. Obtain information from literature and the Internet, to work independently, independently to solve problems from the scope of the theory of analysis of both the systems design and microprocessor devices. - [K_U01 +++]		
2. Able to draw documentation concerning the performance of a task up engineering and to prepare the text containing discussing results of implementation of this task. - [K_U03+++]		
3. Able to build, to start and to test simple electronic systems and in case of detecting ? mistakes to conduct programmable arrangements and ? their diagnosis. - [K_U08++]		
Social competencies:		
1. Understands the need and knows possibilities of constant training oneself of raising linguistic, professional, personal and social competence. - [K_K01 +]		
2. Aware of an importance and understands not technical aspects and effects of activity engineer in information technology and responsibility associated with it for made decisions. - [K_K02 +]		

Assessment methods of study outcomes		
<p>Lecture: ? evaluation of the knowledge and abilities demonstrated on a written exam from the microprocessor engineering.</p> <p>Laboratory exercises: ? the test and awarding a bonus to the essential knowledge of problems for the accomplishment stated in the given area of laboratory tasks, ? evaluation of the knowledge and the abilities associated with the performance of a task exercise, evaluation of the report on the performed exercise.</p> <p>Getting additional points for the activity during classes, particularly too: ? proposing discussing aspects of the issue; ? effectiveness of applying the acquired knowledge while solving a set problem; ? ability of the cooperation in frames of the team practically performing the detailed task in the laboratory; ? aesthetic care of reports drawn up and tasks - in the framework of the own learning.</p>		
Course description		
<p>Lecture: numeral systems, cipher codes logic circuits. Structure of processors. Microprocessors, microcontrollers. PLC programmable logic controllers, arrangements of the entry/exit - RS-xxxx interfaces, I2C Bus and other, communication systems - CAN protocols and other, layouts of the supervisory body (polling) and safety, starting. DSP processors, ASIC arrangements. entering microprocessor control systems into the concept and measuring. Industrial networks in microprocessor distributed systems. PROFBUS and CAN. the Modelling and designing microprocessor control systems. Model microprocessor control systems - control systems in vehicles, road rides, gas industry, intelligent construction, security systems of possessions.</p> <p>laboratories: reading the architecture of the model microcontroller and the programming of the microcontroller in the C programming language in the aspect of the operation of internal devices and outside. Bases of the C51 language specification, realization of selected drivers of internal arrangements among others timer's and of system of interrupts, serial communication, AC converter. Completion of the operation of external devices among others of liquid crystal display, LED, the matrix keyboard. Completion of the model project of the cooperation of the microprocessor system with the external device .</p>		
Basic bibliography:		
<ol style="list-style-type: none"> Rydzewski A. "Mikrokomputery jednokładowe rodziny MCS-51", WNT, Warszawa, 1997 Jabłoński T., Pławsiuk K. "Programowanie mikrokontrolerów PIC w języku C.", BTC, Warszawa, 2002 Krzyżanowski R. "Układy mikroprocesorowe", Mikom, Warszawa, 2004 		
Additional bibliography:		
<ol style="list-style-type: none"> Bogusz J. "Programowanie mikrokontrolerów 8051 w języku C w praktyce", BTC Prace dyplomowe IEEP Politechniki Poznańskiej Internet 		
Result of average student's workload		
Activity	Time (working hours)	
1. participation in lecture classes	15	
2. participation in laboratory classes	30	
3. participation in consultation concerning the lecture	4	
4. participation in consultation concerning the laboratory	8	
5. preparation for the test/exam	4	
6. test/exam	2	
7. the preparation for laboratory exercises and drawing reports up	30	
Student's workload		
Source of workload	hours	ECTS
Total workload	93	3
Contact hours	59	2
Practical activities	68	3