

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Microprocessor technology		Code 1010321351010321118
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 3 / 5
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: 30 Classes: - Laboratory: 15 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. Grzegorz Trzmiel email: Grzegorz.Trzmiel@put.poznan.pl tel. 616652693 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of mathematics, physics, fundamentals of electrical engineering and electronics, including digital.
2	Skills	The ability to understand and interpret knowledge transmitted in the classroom. The ability to effectively self-education in a field related to the chosen field of study.
3	Social competencies	The awareness of the need to expand their competence, their willingness to cooperate within the team.
Assumptions and objectives of the course: Thorough knowledge of theoretical and practical problems associated with the construction elements, components and microprocessor systems and the basis of their programming and design.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. characterize the structure and principles of the basic elements and the processor - [K_W07+++ , K_W09+]		
2. explain the operation of processor and microprocessor systems - [K_W07+++ , K_W14+]		
Skills:		
1. apply his knowledge of the theory of digital circuits required to determine the important parameters of of data transmission and commands - [K_U01++, K_U05+]		
2. obtain information from the literature and the Internet, work individually and independently solve problems in the theory of systems analysis and design and microprocessor devices - [K_U01++, K_U03+]		
Social competencies:		
1. able to think and act in an entrepreneurial manner in the area of analysis microprocessors - [K_K01+, K_K02++]		
Assessment methods of study outcomes		

<p>Lecture:</p> <ul style="list-style-type: none"> - assess the knowledge and skills indicated in a written test with microprocessor technology. <p>Laboratory:</p> <ul style="list-style-type: none"> - test and rewarding knowledge necessary for the accomplishment of the problems in the area of laboratory tasks. - continuous assessment for each course - rewarding the increase in the ability to use principles and methods have met. - assess the knowledge and skills related to the implementation of the tasks of exercises, evaluation reports performed exercise. <p>Get extra points for activity in the classroom, and in particular for:</p> <ul style="list-style-type: none"> - proposing dodatkowo?ych discuss aspects of the subject, - effectiveness of applying knowledge when solving a given problem, - the ability to work within a team practically performing the task detailed in the laboratory, - comments relating to the improvement of teaching materials, - aesthetic diligence reports and jobs - in the framework of self-study. 		
Course description		
<p>Bit Operations, coding, review of the logic. Microprocessors, microcontrollers components: interfaces, memory (array, programmable), communication systems, peripherals. Microprocessor-based systems: buses, addressing. Systems interrupts. Signal processing. Design and programming of microprocessor control systems for sample applications in the areas of production, operation and measurements in different processes.</p> <p>Designing and programming in high level language microprocessors for specific tasks.</p> <p>laboratories:</p> <p>Getting to know the architecture of an exemplary microcontroller and microcontroller programming in C in terms of handling internal and external devices. Basics of C51 language specification, implementation programs, use of selected internal systems, among others, timers and interrupt system, serial, AC transducer. Implementation of external devices, among others, LCD, LED, matrix keyboard. Implementation of the exemplary cooperation project microprocessor system with an external device.</p>		
Basic bibliography:		
<ol style="list-style-type: none"> 1. Rydzewski A.: Mikrokomputery jednocukadowe rodziny MCS-51, WNT, Warszawa 1997. 2. Jablowski T., Plawsiuk K.: Programowanie mikrokontrolerów PIC w języku C, BTC, Warszawa 2002. 3. Krzyzanowski R.: Układy mikroprocesorowe, Mikom, Warszawa 2004. 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. Bogusz J.: Programowanie mikrokontrolerów 8051 w języku C w praktyce, BTC, Warszawa 2005. 2. Diploma theses. 3. Internet. 		
Result of average student's workload		
Activity	Time (working hours)	
1. participation in class lecture	30	
2. participation in laboratory classes	15	
3. consultation on the lecture	6	
4. consultation on the laboratory	8	
5. preparation for the exam	12	
6. grade the laboratory and exam	8	
7. preparation for laboratory exercises and pass the laboratory	16	
Student's workload		
Source of workload	hours	ECTS
Total workload	98	4
Contact hours	67	2
Practical activities	35	1