

MODULE/ COURSE FORM

A. general information

To be completed by Course Team	Module name : Embedded systems and microprocessors				Module code: M15			
	Course name: Embedded systems and microprocessors				Course code:			
	Faculty: INSTITUTE OF APPLIED INFORMATICS							
	Field of study: INFORMATICS			Level of education: first				
	Mode of study : Full-time		Learning profile: Practical		Speciality:.			
	Year/ semester: 2/4		Module/ course status:. Obliga tory		Module/ course language: Polish/English			
	Type of classes		lecture	lessons	lab	project	Tutorial	other (please specify)
	Course load		30		30			
	Module/ course objectives		Learning the basics of microprogramming. Familiarize yourself with the design and operation of embedded systems and the principles of increasing the performance of the processor.					
Entry requirements		Basic knowledge of digital technology, programming fundamentals						
LEARNING OUTCOME								
Nr	LEARNING OUTCOME DESCRIPTION					Learning outcome reference		
01	knowing the basics principles of the central processing unit (CPU)					K_W03, K_W05		
02	knowing the basics of microcontroller programming					K_W07, K_W15		
03	understanding the principle of executing a program instructions in a microprocessor					K_W10		
04	writing simple programs that control the microprocessor's internal blocks					K_U03, K_U04, K_U08, K_U15		
05	performing in the program simple procedures for internal microcontroller peripheral control					K_U03, K_U04, K_U08, K_U15		
06	designing a simple system based on a microcontroller					K_U03, K_U04, K_U06, K_U08, K_U15		
07	knowing the significance of embedded systems In consumer electronic					K_K01, K_K02		
Assessment method					Learning outcome number			
Exam in a written form with a theoretical and practical part					1 - 3			
Written quizzes					1 - 6			
Practical tasks and Project					4 - 6			

STUDENT WORKLOAD

	Number of hours	
	In all	including practical
Participation in lectures	30	30
Independent study of lecture topics	15	15
Participation in tutorials, labs, projects and seminars	30	30
Independent preparation for tutorials*	30	30
Preparation of projects/essays/etc. *	30	30
Preparation/ independent study for exams	10	10
Participation during consultation hours	5	5
Other	2	
TOTAL student workload in hours	152	150
Number of ECTS credit per course unit	6 ECTS	
Number of ECTS credit associated with practical classes	6 ECTS	
Number of ECTS for classes that require direct participation of professors	2,6 ECTS	

B. details information

To be completed by Course Team	Module name : Embedded systems and microprocessors					Module code:	
	Course name: Embedded systems and microprocessors					Course code:	
	Faculty: Institute of Applied Informatics						
	Field of study: INFORMATICS				Level of education: first		
	Mode of study : Full-time		Learning profile: Practical		Speciality::		
	Year/ semester: 2/4		Module/ course status:: obligatory			Module/ course language: Polish/English	
	Type of classes	lecture	lessons	lab	project	Tutorial	other (please specify)
	Course load						
	Module/ course coordinator		dr inż. Robert Smyk , dr hab. inż. Zenon Ulman				
Lecturer		dr inż. Robert Smyk , dr hab. inż. Zenon Ulman					
CURRICULUM CONTENTS							
Lecture							
<p>Microprocessors and microcontrollers. Modules of microcontrollers. Examples of construction and organization. Microprocessor programming languages. The role of operational programs, their functions and role in control. Types of operational programs. Interoperability with driver modules. Secure data processing. Ways to improve the reliability and security of information.</p> <p>Including content related to practical vocational training: [100%]</p>							
laboratory							
<p>Laboratory exercises include practical learning about embedded devices and how to use them. Getting familiar with the IDE for embedded software development, learn the basics of assembly language, learn the structure and behavior of typical CPUs based on the analysis of simple assembler examples, the basics of programming embedded systems in high-level languages, the rules for using development libraries dedicated to embedded systems, programming elementary CPU I / O on selected examples (for ex. keyboard, 7-segment display, text / graphic display), programming of internal CPU blocks / registers, examples of simple programming selected communication interfaces (UART, SPI, I2C), interrupts.</p> <p>Including content related to practical vocational training: [100%]</p>							
Project (other)							

Basic literature	<ol style="list-style-type: none"> 1. R. Palka: Mikroprocesory, WNT 2. M. M. Mano, Ch. R. Kima: Podstawy projektowania układów logicznych i komputerów, WNT 3. W. Stallings. Organizacja i architektura systemu komputerowego, WNT
Additional literature	
Teaching methods	<p>Lecture</p> <p>Laboratory</p>
Form and terms of an exam	Assessment based on 2 colloquy and written exam on the subject in the examination session.