COURSE DESCRIPTION CARD - SYLLABUS

Course name
Microprocessors systems

Course

Field of study
Mathematics in Technology

Year/Semester
3/6

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	15	0
Tutorials	**Projects/seminars**	
0	0	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:

Prerequisites

Basic knowledge of digital electronics and also in scope of C++ programming language. Can design a simple combinational circuit. Can write a simple program in C++. Observe the rules of ethics in scope use of software.

Course objective

Knowledge in scope of architecture and principles of operation of microprocessor system and also properties of microcontrollers, their programming languages and debugging tools

Course-related learning outcomes

Knowledge

1. Has basic knowledge in scope of microprocessors architecture and microprocessor systems using microcontrollers.

2. Has basic knowledge in scope of programming languages and debugging tools for microcontrollers.

Skills

1. Can design of algorithm, use of programming languages and debugging tools in scope of microprocessor.

2. During the tests of microprocessor system can acquire of specialistics knowledge from catalogs .

Social competences

1. Can ask a precisely questions for the purpose of the better understanding of problems.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Final exam in a form of a test (passing over 50%).

Laboratory classes: Current estimating of knowledge and skills. Current estimation of ability to programming. Evaluation of prepared reports from laboratories.

Programme content

Update: 2020.

Lectures: Architecture and principle of operation of microprocessor, single-chip microcomputer and microcontroller. Memory map and architecture of microprocessors system. Addressing modes and format of instructions. Programming languages of microprocessors: assembler and C++. Design of microprocessors systems. Harvard and von Neumann architectures of microcontroller. Internal resources and principle of operation of internal I/O chips: A/D converters, counters and PWM outputs. Co-operation with external I/O chips (example: LCD display) and measuring sensors. Interfaces of communication: USB, USART, I2C, SPI, 1-Wire.

Laboratory classes: Programming of microcontrolers in asembler and C++ languages.

Teaching methods

Lectures: Multimedia presentations expanded by examples shown on a board. Activity of students is taken into consideration in final students evaluation. Theoretical questions are presented in the exact reference to the practice.

Laboratory classes: Detailed reviewing of particular exercises reports. Realization of laboratory tasks in teams. Specific computational experiments.

Methods of education are orientated to students to motivate them to participate actively in education process by discussion and reports.

Bibliography

Basic

1. Baranowski R. Mikrokontrolery AVR AT MEGA w praktyce. Wydawnictwo BTC, Warszawa 2005.

2. Kniat J. Programowanie obiektowe w języku C++. Wydawnictwo Politechniki Poznańskiej, Poznań 1995.

3. Bogusz J. Lokalne interfejsy szeregowe w systemach cyfrowych. Wydawnictwo BTC, Warszawa 2004

4. Sibigtroth J.M. Zrozumieć małe mikrokontrolery, Wydawnictwo BTC, Warszawa 2003.

5. Pełka R. Mikrokontrolery architektura, programowanie, zastosowania. WKiŁ, Warszawa 1999.

6. Tietze U., Schenk Ch. Układy półprzewodnikowe, WNT Warszawa 1996.

Additional

1. Hajduk Z., Mikrokontrolery w systemach zdalnego sterowania. Wydawnictwo BTC. Warszawa 2005.

2. Horowitz P., Hill W., Sztuka elektroniki t.2. WKiŁ, Warszawa 1996

3. Mielczarek., Szeregowe interfejsy cyfrowe, Wydawnictwo Helion, Gliwice 1993.

Breakdown of average student's workload

	Hours	ECTS
Total workload	85	3,0
Classes requiring direct contact with the teacher	53	2,0
Student's own work (literature studies, preparation for laboratory classes, preparation for exam) [1]	32	1,0

[1] delete or add other activities as appropriate