



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Programming microcontrollers [S2AiR2-ISAiR>PO3-PM]

Course

Field of study

Automatic Control and Robotics

Year/Semester

1/2

Area of study (specialization)

Intelligent Control and Robotic Systems

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

30

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

3,00

Coordinators

dr inż. Adam Turkot

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Lecturers

Prerequisites

Basic programming skills in C / C ++. Basics of electrical circuits and electronic systems. Basic computer skills. Efficient use of the Internet and the basics of English will be very useful in using network resources

Course objective

The aim of the course is to present microcontrollers. Discussion of the microcontroller architecture and the possibilities of application in automation and electrical engineering as well as in everyday life. Deepening C programming skills by developing control functions. Programming the interface peripherals by the student allows to develop programming skills of modern electronic devices.

Course-related learning outcomes

Knowledge

K2_W4 understands the design methodology for specialized analog and digital electronic systems;

K2_W6 has detailed knowledge of the construction and use of advanced sensory systems;

K2_W11 has structured and in-depth knowledge related to control systems and control and measurement systems;

K2_W13 has basic knowledge about the life cycle of automation and robotics systems as well as control

and measurement systems;

K2_W18 has ordered and in-depth knowledge of specialized microprocessor systems intended for control systems and control and measurement systems;

Skills

K2_U1 can critically use literature information, databases and other sources in Polish and a foreign language;

K2_U2 is able to analyze and interpret project technical documentation and use scientific literature related to a given problem;

K2_U13 is able to select and integrate elements of a specialized measurement and control system including: control unit, executive system, measurement system as well as peripheral and communication modules;

K2_U26 is able to construct an algorithm for the solution of a complex and unusual measuring and computing-control task as well as implement, test and run it in the selected programming environment on a microprocessor platform;.

Social competences

K2_K1 understands the need and knows the possibilities of continuous training - raising professional, personal and social competences, is able to inspire and organize the learning process of others;

K2_K4 is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions; is ready to develop his professional heritage;

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: Credit in the form of a multiple-choice test.

Project: Evaluation of completed projects

Programme content

The program content of the lecture coincides with the content presented in the laboratory in the form of practical exercises during which the presented technologies are processed.

Architecture of the microcontroller system

GPIO

Time / counter systems

Interrupt handling system and its handling

A/C C/A converters

Basic sensors used in microcontroller systems

Displays used in microcontroller systems

Wired and wireless communication interfaces

Course topics

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Teaching methods

Teaching materials in the form of lectures and a script for laboratory exercises are placed in an electronic version on the website indicated by the teacher. The current address is given during the first class by the teacher. Lecture with multimedia presentations.

Bibliography

Basic

Pełka R.: "Mikrokontrolery - architektura, programowanie, zastosowania". Wydawnictwa Komunikacji i Łączności, Warszawa 2003 .

Additional

www.arm.com

www.st.com

www.arduino.cc

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00