



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Programowanie mikroprocesorów - Microprocessor Programming

Course

Field of study

Teleinformatics

Year/Semester

3/5

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

compulsory

Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

Tutorials

0

Projects/seminars

0/0

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Maciej Krasicki
Institute of Radiocommunications
email: maciej.krasicki@put.poznan.pl
phone: +48 61665 3918

Responsible for the course/lecturer:

Lecturer:
dr hab. inż. Paweł Szulakiewicz, prof. PP
Institute of Radiocommunications
email: pawel.szulakiewicz@put.poznan.pl
phone: +48 61 665 3822

Prerequisites



Knowledge and skills gained from the undergraduate courses in digital circuits and programming in C during the first two years of studying teleinformatics or electronics and telecommunications.

Course objective

The course objective is to give students basic knowledge and skills in the field of microprocessors and microcontrollers, i.e. their architectural variations, programming in assembly language and in C, their applications, etc. Examples of some microprocessors and microcontrollers are examined.

Course-related learning outcomes

Knowledge

Knowledge in architectural variations of the microprocessor examples, their technical data and programming.

Skills

Students are able to choose the right model of microprocessor to the application and to develop program in assembly language or in C language.

Social competences

Interest and curiosity in the field of microprocessors and microcontrollers.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes are verified by the oral or written examination after the lectures. Abilities to program in assembly language and in C language are checked during the laboratory exercises.

Programme content

Lectures:

Introduction to microprocessors and microcontrollers.

Family of 8-bit microcontrollers (8051/52 architecture, registers, timers, serial port, memory, interrupts, instruction set, assembly language programming, single board computer, tools for program development)

Overview of Intel 16.32.64 bit microprocessors.

ARM Cortex M3/M4 microcontrollers (architecture, registers, interrupts and exceptions, interrupt controller, the memory map, bit-band operations, the instruction set, assembly language programming, program examples)

Laboratory:

Intel 8051/52 -- assembly language program development, tools and techniques for program development

ARM Cortex M4 - C language program development, tools and techniques for program development



Lectures:

Introduction to microprocessors and microcontrollers.

Family of 8-bit microcontrollers (8051/52 architecture, registers, timers, serial port, memory, interrupts, instruction set, assembly language programming, single board computer, tools for program development)

Overview of Intel 16.32.64 bit microprocessors.

ARM Cortex M3/M4 microcontrollers (architecture, registers, interrupts and exceptions, interrupt controller, the memory map, bit-band operations, the instruction set, assembly language programming, program examples)

Laboratory:

Intel 8051/52 =- assembly language program development, tools and techniques for program development

ARM Cortex M4 - C language program development, tools and techniques for program development

Teaching methods

Lectures

Laboratory exercises

Bibliography

Basic

Lecture slides (3 files)

MCS 51 Microcontroller Family Users Manual

AN237 Migrating from 8051 to Cortex Microcontrollers

Intel 64 and 32 Architectures – Software Developer’s Manual

TI486 Microprocessors Reference Guide

White paper – Cortex-M for Beginners

ARM and THUMB-2 Instructions Set Quick Reference Card

Educational materials for the laboratory exercises are available from the laboratory teacher

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	120	5.0
Classes requiring direct contact with the teacher	64	3.0
Student’s own work (preparation for tests, preparation for laboratory classes, preparation for exam, literature studies)	56	2.0