COURSE DESCRIPTION CARD - SYLLABUS

Course name
Microprocessor Programming [S1Teleinf1>PMIKROP]

Course

Field of study
Teleinformatics

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

dr hab. inż. Maciej Krasicki
maciej.krasicki@put.poznan.pl

Lecturers

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 he 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

Architecture, programmer's model of selected microprocessors, code development.

Course topics

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 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

Lecture basing on both slide presentation and reference manuals; the integral part of the lecture is discussion with the students on exemplary code fragments.

During lab classes students acquire programming skills and learn how to launch and debug their code for selected microprocessors.

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	5,00
Classes requiring direct contact with the teacher	64	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	56	2,00