

**COURSE TITLE:                   MICROPROCESSORS AND MICROCONTROLLERS**

Institute/Division:           Chair of Electrotechnics and Electronics / Faculty of Electrical and Computer Engineering

Course code:                   E3mProc

Erasmus subject code:       11.3

Number of contact hours:     45

Course duration:            1 semester

ECTS credits:                6

Course description:

The course begins with an overview of microcontroller-based systems, including applications, architecture, number systems, and languages. The main subjects covered in detail are: microcontroller hardware, CPU registers, internal/external RAM memory, internal/external ROM memory, I/O ports, timers and counters, serial ports, hardware interrupts, clock systems, A/D and D/A converters, connecting the microcontroller to external devices, LCD and LED displays, power devices, measurement of external analog signals and signal processing. Considerable attention is paid to C programming. Students will learn different capabilities of the microcontroller through in class exercises. By the end of this course, the student should be able to write code in C language, respond to input from the user (via buttons or keypad), perform basic binary arithmetic, perform table lookups, display output to the user (via LCD display, LEDs or PC display), control external devices, respond to internal and external interrupts, acquire and analyze analog signals in real-time.

Course type:                 Lectures (20h), computer laboratory (20h) and project (5h)

Literature:                 Joe Pardue, *C Programming for Microcontrollers*, SmileyMicros.com

**Steven Barrett, Steven F Barrett, *Embedded System Design with the Atmel AVR Microcontroller*, Morgan & Claypool Publishers, 2009**

**A.P. Godse, D.A. Godse, *Microprocessor & Microcontroller*, Technical Publications, 2010**

Assessment method:         Project and laboratory exercises

Prerequisites:               digital electronics basics

Primary target group:       undergraduate students

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