

SYLLABUS

1. Course title:

Design of Microprocessor Based Systems

2. Code:

AR207

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course: Mandatory Elective**6. Prerequisites:**

[AR105] Logic Systems Design, [RI101] Introduction to Programming

7. Class restrictions:**8. Duration / semester:**

1

6

9. Weekly contact hours:

9.1. Lectures:

3

9.2. Seminars:

0

9.3. Laboratory/Practice classes:

2

10. Faculty:

Faculty of Electrical Engineering

11. Department/study program:

Electrical Engineering and Computer Science

12. Lecturer:

Ph.D. Naser Prljača, full professor

13. Lecturer's e-mail:

naser.prljaca@untz.ba

14. Web site:

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15. Course aims:

The course aims to familiarize students with design methods of embedded microprocessor-based systems used in automation and robotics.

16. Learning outcomes:

The student should master the architecture of modern microprocessors, with special reference to the microprocessors used in microcontrollers and SoC's. Should be able to develop embedded systems, of moderate complexity, including hardware interfacing and development of application software using the assembler and C / C++ languages, with or without an RTOS's.

17. Course content:

Use and design of microprocessor based embedded systems. Microprocessor architecture. CISC and RISC processors. ARM 32-bit RISC processor architecture and features. The control unit and the arithmetic-logic unit. Pipelining. Registers, bus, memory and I/O peripherals. Processor modes. Exceptions and interruptions. Coprocessors (FPU, processing audio and video, etc.). ARM instruction set. ARM Thumb and Thumb 2 instruction sets. Assembly, C, C++ programming of ARM microcontrollers. Operating systems of embedded microprocessor systems. Operating system services. Concurrent execution of tasks (processes, threads). Tasks schedulers. Memory management. Synchronization and intertask communication (mutexes, semaphores, shared memories, message queues). The file system management.

18. Learning methods:

Empty box for learning methods.

19. Assessment methods:

Empty box for assessment methods.

