# SYLLABUS

**1. Course title:**

Microprocessor Systems in Telecommunications

**2. Code:**

TK402

**3. Cycle of study:**

1

**4. ECTS credits:**

6

**5. Type of course:**

◉ Mandatory          ○ Elective

**6. Prerequisites:**

[TK004] Digital Signal Processing, [TK204] Information Theory and Coding, [TK301] Digital Telecommunications

**7. Class restrictions:**

None

**8. Duration / semester:**

1          7

**9. Weekly contact hours:**

9.1. Lectures: 3

9.2. Seminars: 1

9.3. Laboratory/Practice classes: 1

**10. Faculty:**

Faculty of Electrical Engineering

**11. Department/study program:**

Electrical Engineering and Computer Science

**12. Lecturer:**

Ph.D. Asmir Gogić, assistant prof.

**13. Lecturer's e-mail:**

asmir.gogic@untz.ba

**14. Web site:**

(max. 50 characters)

**15. Course aims:**

Gain basic understanding of the unique challenges during implementation of the digital telecommunication techniques and algorithms on microprocessors/microcontrollers.

**16. Learning outcomes:**

Students will gain skills required for analysis, design and implementation of embedded telecommunication system using microcontrollers (MCU). Furthermore, students will gain basic knowledge of MCU architecture, toolchain setup and programming using C/C++ languages.

**17. Course content:**

Microprocessor/Microcontroller architecture. Initialization and control of peripheral modules, interrupts and DMA. Communication interfaces. Implementation of basic DSP operations: filters (FIR, IIR) and discrete Fourier transformation (FFT algorithms). Principles behind implementation of basic operations within the telecommunication system (modulations, correlation receiver, equalization). Techniques of channel coding/decoding. Data encryption. Common communication protocols in sensors.

## 18. Learning methods:

- Lectures aided with multi-medial presentations and active discussion with students
- Practical laboratory exercise

## 19. Assessment methods:

Homework during the semester and final exam as practical project. Final project includes design and implementation of the embedded telecommunication system.

**20. Assessment components:**

| Activity | Points |
|---|---|
| Test, homework & projects during semester | 60 |
| Final exam | 40 |
| Total | 100 |

**21. Required reading list:**

- J.G. Proakis, Digital Signal Processing: Principles, Algorithms and Applications 4th ed., 2007
- Donald Reay, Digital Signal Processing Using the ARM Cortex M4, Wiley, 2015
- Gerard C. M. Meijer, Smart Sensor Systems, Volume 10, John Wiley & Sons, 2008

**22. Web sources:**

(max. 687 characters)

**23. Applicable starting from the academic year:**

2016/2017

**24. Adopted in the Faculty/Academy session:**

04.04.2016