SYLLABUS

1. Course title:

Digital Telecommunications

2. Code:

TK301

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

[TK101] Signals and Systems, [TK201] Statistical Theory in Telecommunications

7. Class restrictions:

8. Duration / semester:

1 6

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. Nermin Suljanovic, full prof.

13. Lecturer's e-mail:

nermin.suljanovic@untz.ba

14. Web site:

(max. 50 characters)

15. Course aims:

Learn basic digital communication techniques and fully understand detailed performance analysis of communications systems.

16. Learning outcomes:

Student will gain knowledge about digital communication techniques, analyze properties of digital communication techniques, design matched filters and equalizers, understand synchronization in digital communication systems, understand telecom equipment functionalities and analyze digital comm system performance.

17. Course content:

Digital communication system components. Regeneration. Characterizing noise. Digital modulation techniques. Source coding and baseband transmission (PCM, Delta modulation, Delta-sigma modulation, DPCM). Line codes. Scrambling. Signal space. Modulated signals in signal space. Baseband transmission and matched filter. Error probability for binary PCM. Bandpass transmission. Correlation-type demodulator. Optimal detector. Intersimbol interference (ISI). Nyquist criteria for zero ISI. Equalization. Basics of multi-carrier modulation. Carrier synchronization and PLL. Symbol recovery. FPGA implementation of digital modulation schemes.

18. Learning methods:

Lecturing with projected presentations and necessary derivations on blackboard, with active student participation. Seminars include problem solving and use cases. Laboratory is based on experimental setups and numerical simulations.

19. Assessment methods:

Test and homeworks during semester and final exam.

20. Assessment components:

Midterm test and homeworks are 60% of the final grade. The final written test is 40%.

21. Required reading list:

- N. Suljanović, A. Gogić, A. Mujčić, “Statistička teorija telekomunikacija”, Tuzla, 2015.
- M. H. Degrot, M. J. Schervish, "Probability and Statistics", Addison-Wesley, 2012.
- Douglas C. Montgomery, “Applied Statistics and Probability for Engineers”, 2003.

22. Web sources:

(max. 687 characters)

23. Applicable starting from the academic year:

2016/17

24. Adopted in the Faculty/Academy session:

04.04.2016