SYLLABUS

1. Course title:

Linear Automatic Control Systems II

2. Code:

AR201

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

[AR103] Linear Automatic Control Systems I

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. Naser Prljača, full professor

13. Lecturer's e-mail:

naser.prljaca@untz.ba

14. Web site:

15. Course aims:

The main goal of the course is to present the fundamental knowledge of the theory of automatic control systems. It represents the basic techniques of analysis and design of continuous linear control systems in the frequency domain and the state space domain. It also represents a modern software and hardware tools for analysis, design and implementation of control systems.

16. Learning outcomes:

Students will develop a systematic mathematical approach to the analysis and design of automatic control systems, and will be able to model, analyze and design a so-called classical and modern control system for systems of medium complexity.

17. Course content:

Frequency characteristics of linear systems. Construction of frequency diagrams. Stability analysis in the frequency domain, the Nyquist stability criterion. The relative stability and the stability margins. Transient and steady state specifications of automatic control systems in the frequency domain. Design of integro-differential compensators and PID controllers in the frequency domain using Bode's diagrams. The concept of the state space of linear dynamic system. Similarity transformations and canonical forms of the state space. Analysis of the stability in the state space. Lyapunov's stability theory. The controllability and observability of the linear system. The design of the regulator in the state space, the state space pole placement regulator. State vector estimators (observers) and their design. The principle of separation. The design of the linear deterministic optimal regulator in the state space. Design of optimal linear stochastic state space controller and Kalman's filter. Basic of digital control. The design of digital controllers by emulating continuous controllers.

18. Learning methods:

19. Assessment methods:

20. Assessment components:

21. Required reading list:

N. Prljača, Z. Šehić, Automatsko Upravljanje – Analiza i Dizajn, Mikroštampa , Tuzla, 2008
R. Dorf, R. Bishop, Modern Control Systems, Prentice Hall, 2010
Z. Gajić, M. Lelić, Modern Control Systems Engineering, Prentice Hall, 1996

22. Web sources:

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016