SYLLABUS

1. Course title:

Theory of Electrical Circuits

2. Code:

EEMS002

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 3

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. Mirza Kušljugić, full prof.

13. Lecturer's e-mail:

mirza.kusljugic@untz.ba

14. Web site:

15. Course aims:

Objective of the course is to introduce to the students techniques and methods for solution and analysis of linear time invariant (LTI) electric circuits in time and frequency domain. Main characteristics of LTI circuits in time and frequency domain are desribed in detail. In frequency domain subjects of theory of elements with four poles and basics of electric filters are developed.

16. Learning outcomes:

Learning outcomes are: understanding physical processes in linear electric circuits in transient states, taking into account the interaction between the circuits components (natural, compulsory and complete circuit response); to know methods for modeling of dynamic models of electric circuits and methods for solving circuit response, and the ability to analyze dynamic models and the characteristics of the electric circuit transient response in time and frequency domain; familiarize with modeling methods and functions of four poles and filters and analyzing the circuit stationary response with non-sinusoidal periodic exitations.

17. Course content:

Modeling of stationary and dynamic circuit elements. Solution of transient response of first and second order circuits. Analysis of linear time invariant (LTI) circuits in time domain. Convolution integral. Solution of transient response of LTI circuits in complex frequency s-domain. Oscillatory circuits and resonancies. Application of Fourier series in stationary solutions of circuits with non-sinusoidal periodic exitations. Basic theory of elements with four poles. Basic theory of passive electric filters.

18. Learning methods:

The following learning methods are used: lectures using multimedia tools, illustrations of using the presented methods in simple electric circuits by solving the appropriate assignments and illustrating the use of the PSPICE simulation package.

19. Assessment methods:

Written and oral exams are organized. Written exam is combination of theoretical questions and solutions of numerical problems, which were practiced during lectures and practice hours. Final exam is composed of the discussion regarding material passed on the written exam.

20. Assessment components:

Attendance 10%, written part of the exam - theory 50% , written part of the exam - assignments 30%, reports from laboratory exercises 10%.

21. Required reading list:

M. Kušljugić, M. Hajro: "Elementi i metode u analizi električnih kola"
M. Kušljugić, M. Hajro:"Analiza električnih kola u vremenskom domenu"
D.E. Scott: "An Introduction to Circuit Analysis – A System Approach"

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