SYLLABUS

1. Course title:

Fundamentals of electrical engineering and electronics

2. Code:

3. Cycle of study:

1

4. ECTS credits:

4

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

Mathematics

7. Class restrictions:

(max. 150 characters)

8. Duration / semester:

1 4

9. Weekly contact hours:

9.1. Lectures:	2
9.2. Seminars:	1
9.3. Laboratory/Practice classes:	0

10. Faculty:

Faculty of mechanical engineering

11. Department/study program:

Production, energetic mechanical engineering and mehatronics

12. Lecturer:

Majda Tesanovic, assistant professor

13. Lecturer's e-mail:

majda.tesanovic@untz.ba

14. Web site:

www.oe.fe.untz.ba

15. Course aims:

The course gives understanding of electrical engineering concepts, laws and principles regarding electrostatics, DC electrical circuits, electromagnetics, AC circuits and electronics. After finishing this course students will be able to analyze AC/DC electrical circuits and understand underlying physical phenomena. The aim of the course is to overcome the integrated process of theoretical and practical basics through research and laboratory work and mathematical methods for analisys of complex problems.

16. Learning outcomes:

1.define and understand the fundamental concepts related to electric and magnetic fields
2. understand and apply electrostatic and magnetostatc field laws
3. apply superposition method for electric and magnetic filed calculation
4. Understand and apply Kirchhoff's Laws to AC/DC circuit analysis.
4. analyze DC/AC circuits by following circuit analysis methods and theorems

17. Course content:

Electrostatics
Structure of matter. Electric charge, Coulumbo law and electric field vector. Electric potential and voltage, field and potential relationship. Flux of electric field vector. Gauss Law. Conductor in electric field. Electrostatic induction. Capacitance, capacitors. Dielectrics in electric field. Dielectric polarization and polarization vector. Maxwell's postulate. Dielectric characteristics. Electrostatic field energy and forces. er the influence of electrostatic field.
The overview of development and current trends in electrical engineering and computer science. Fundamentals of electricity, capacitance. Electric current and electrical phenomena. Concepts, elements and topology of electric circuits. Ohm's Law. Kirchhoff s laws. Elementary DC circuits.
The themes are: Lorentz force, magnetic flux density. Sources: current. Charge in uniform motion: Ohm s law, resistance. Biot-Savart s law, Ampere s circuital law, magnetic materials, energy in magnetic field, inductances, magnetic circuits. Faraday s law.Characterstics of magnetic materials. Magnetic circuits. Inductance and mutial inductance. Magnetic field energy.
Current and voltage waveforms. Amplitude and effective value of current or voltage. AC Generator. Complex calculus in analysis of AC circuits. RLC circuits. Topographic and locus diagrams.
Electronics:materials and elements (diode, transistor, tiristor)

18. Learning methods:

Lectures- Involvement in lectures
Exams- Computer aided, written, and oral exams
Laboratory Work- Laboratory work
Consultations- Lecturers consultations
Other -Individual work and learning
E-learning -Homework

19. Assessment methods:

Written exams (calculations) in XV week
Final exam: written and oral (theoretical issues and solve practical problems)

20. Assessment components:

Continuous Assessment
Homeworks 5 %,
Electrostatic+DCelectric circuirs (I midterm exam) 20 %
Electromagnetic+AC Electric circuits (II midterme exam) 20 %
Class participation 5 %
Exam
Test 1(theory)-Electrostatic+DCelectric circuirs 10 %
Test 2 (theory)- Electromagnetics+AC Electric circuits 10 %
Final Exam (oral or written) 30 %
Maximam: 100 %

21. Required reading list:

1. Hot E.,Osnovi elektrotehnike, knjiga prva, Svjetlost Sarajevo, 1996.
2. Hot E.,Osnovi elektrotehnike, knjiga druga, Svjetlost Sarajevo, 1996.
3. Kapetanović I., Sarajlić N., Konjić T., Osnovi elektrotehnike-zbirka zadataka, knjiga 1,2, 3

22. Web sources:

www.fe.untz.ba, www.mf.untz.ba

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016