SYLLABUS

1. Course title:

Diagnostics in Energy

2. Code:

ESKE204

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

- (●) Mandatory
- ( ) Elective

6. Prerequisites:

Fundamentals of Electrical Engineering I and II, Electrical Measurements, Sensors and Transducers

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. Vlado Madžarević, full professor

13. Lecturer's e-mail:

vlado.madzarevic@untz.ba

14. Web site:

15. Course aims:

The aim of the course is to give students basic knowledge and skills that will enable them to understand well what to do, when to do it and how to interpret the results of the application of new technologies in on-line and off-line diagnostic testing equipment for the purpose of making optimal decisions regarding their maintenance .

16. Learning outcomes:

1. Explain the basic methods and procedures for testing of electrical machines and devices,
2. Expose methods of measurement of electrical quantities at work of electrical device and application of standards, recommendations and regulations,
3. Carry out measurements on electrical machines and devices,
4. Make overall measurement display all measurements on a given machine / device,
5. Propose a way of test and measurement that will fulfill the requirements,
6. Choose engineering approach in solving practical problems, starting from the acquired knowledge from physics, mathematics, foundamentals of electrical engineering, electrical machinery

17. Course content:

Reliability of technical systems as well as its characteristics. Systematic techniques for maintenance planning; preventively (traditionally - time-based and based on the conditions in which there is equipment) and corrective maintenance. Typical faults and diagnosis of electrical machines. Monitoring and diagnostics failures. Methods of monitoring: electric, acoustic, electro-optical, mechanical and thermal sensors. Diagnostics of energy transformers. Testing of safety and dimensions of the core. Diagnostics of state insulating ability. Measurement of the ratio of the transmission, the group of the compound, the measurement idling and short-circuit. Diagnostics of state induction motors. Systematization characteristic faults of induction motors. Heating induction machine. Measurement of the stator heating. Measurement of rotor heating. Diagnostics the state of synchronous machines. Testing of the stator package. Short circuit and reactance synchronous machines. Vibration analysis and preventive maintenance. Diagnostics failures in electrical machines using vibration analysis.

18. Learning methods:

Lectures with the use of multimedia resources
Calculation (auditory) exercise
The experimental (laboratory) exercises
To make students acquainted with the real conditions of production of electric machines in order to better understand the acquired theoretical knowledge during the semester are planned visits to firms

19. Assessment methods:

The exam is taken in writing and orally. The written exam is a combination of theoretical questions and calculation examples done on lectures and exercises. The final exam is an oral exam, which consists of the discussion passed the written exam.

20. Assessment components:

Rating exam is based on the total number of points a student earned by completing pre-exam and a final exam. The student can achieve a maximum of 100 points according to the following scale:
Test I 25
Test II 25
Attendance 5
Lab. exercise 5
Final exam 40

21. Required reading list:

I. P. Girdhar, C. Scheffer: "Practical Machinery Vibration Analysis and Predictive Maintenance", London, the 2004th
M. Petrovic: "Testing of electrical machines", Belgrade, 2000th
N.Srb: "Magnetic monitoring of rotating electrical machines", Zagreb, 2004

22. Web sources:

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016.