UNIVERSITY OF TUZLA · UNIVERZITET U TUZLI

SYLLABUS

1. Course title:

Electrical Machines I

2. Code:

ESKE105

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

◉ Mandatory ○ Elective

6. Prerequisites:

[ESKE002] Fundamentals of Electrical Engineering II

7. Class restrictions:

8. Duration / semester:

1   4

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. Nerdina Mehinović, associate professor

13. Lecturer's e-mail:

nerdina.mehinovic@untz.ba

14. Web site:

15. Course aims:

The course aims to provide the basis for understanding the principles of transformers, induction and synchronous machines.

16. Learning outcomes:

At the end of the semester / course successful students, who during the entire period of teaching continuously perform their duties, will be able to: understand the basic aspects of the construction of transformers and rotating electric machines, knowledge of alternative schemes for stationary states, knowing the basic mechanical properties of individual machines. Understanding of power flows in the motor and generator mode. Proper use of electrical machines in practice.

17. Course content:

Magnetic circuits and windings of the transformer, work at idle, Ideal and real transformers under load. Three-phase transformers, coupling. Parallel work of transformers. Unbalanced work of the transformer. The windings and magnetic fields of the electric machine for alternating current. Analytic theory of induction machines: basic equations, torque, work stability, Klosov equation, equivalent scheme. Commissioning an induction motor. Rotation speed control of induction motors. Single-phase asynchronous motor. Transient analysis and mathematical models in the reference coordinate system. The basic elements of the structure of synchronous machines. The magnetic excitation force, the induction and flux of stator and rotor. EMS induced stator, a condition of converting energy, inductance. The vector diagrams (Potije and Blondel), replacement scheme. Synchronization to the network, setting up of active and reactive power.

18. Learning methods:

Lectures with the use of multimedia resources
Calculation (auditory) exercise
The experimental (laboratory) exercises.
During the semester are planned visits to companies in order to introduce students to the real conditions of production and diagnostics of electrical machines.

19. Assessment methods:

The exam is written and orally. The written exam is a combination of theoretical issues and computational examples done on lectures and exercises. The final exam is oral exam consisting of essay and discussion of theoretical issues.

20. Assessment components:

Rating exam is based on the total number of points a student earned by completing pre-exam requirements and exams, according to the quality of the acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale:

Test I 25

Test II 25

Attendance 10

Final exam 40

21. Required reading list:

Š. Masic: "Electrical machines", University of Sarajevo - Faculty of Electrical Engineering in Sarajevo, Sarajevo 2005th

Harlow, H. James: "Transformers", CRC Press LLC; 2000

R. Wolf: "Fundamentals of Electrical Machines", School books, Zagreb 1991

22. Web sources:

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016.