SYLLABUS

1. Course title:

Sensors and Transducers

2. Code:

ESKE103

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(●) Mandatory ( ) Elective

6. Prerequisites:

[ESKE001, ESKE002] Fundamentals of Electrical Engineering I and II, [FIZ1] Physics 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. Nerdina Mehinović, associate prof.

13. Lecturer's e-mail:

nerdina.mehinovic@untz.ba

14. Web site:

15. Course aims:

The course aim is to introduce students to physical working principles of sensors and transducers. Through the course students should be able to learn specific characteristics of sensors and transducers, their advantages and limitations, which will provide them to make a selection of the transducer in some typical practical transducer applications.

16. Learning outcomes:

By the end of the semester successful students, who have continuously completed their responsibilities during the entire course, will have the ability to:
Define basic functions of sensors and transducers
Describe and understand sensors working principles
Explain and understand different performances of sensors and transducers
Explain and understand the difference between chemical sensors and biosensors
Understand different aproaches in selection of the most convenient sensor depending on the media, type of analysis or required sensor precision
Use acquired knowledge in selection of the convenient sensor for practical field or laboratory purposes

17. Course content:

Basics sensor techniques, sensors classification, physical working principles, structure of the sensors. Technical sensor characteristics, static characteristics, dynamic characteristics, increasing accuracy methods. Resistive sensors, working principles, measurement circuits. Capacitive sensors, performance types, measuring circuits. Electromagnetic sensors. Piezoelectric sensors, performance types, measurement circuits. Optical sensor. Chemical sensors. Biosensors. Microsensors. Basic classification of actuators. Importance and application areas of electromechanical, hydraulic and pneumatic actuators. Electromagnet and electric motor as actuators.

18. Learning methods:

Lectures with usage of multimedia
Seminars
Laboratory/Practise classes
Study visits

19. Assessment methods:

Exams are taken in written and spoken. Written form is a combination of theoretical questions and calculation examples, done during the lectures and seminars. The final exam is done in spoken form and consist of discussion of the passed written exam.

20. Assessment components:

A grade is formed as a total amount of points, which student collects during a semester and in the final exam. The student can get maximum 100 points according to a grading method given below:

Test I	25
Test II	25
Attendance	10
Final Exam	40

21. Required reading list:

M. Popović: "Senzori i mjerenja", četvrto izdanje, Zavod za udžbenike i nastavna sredstva Sarajevo, 2004.
J.R. Hendershot Jr., TJE Miller: "Design of Brushless Permanent-Magnet Motors", Clarendon Press; 1994

22. Web sources:

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016