BM6251

Study program / course: Mechanical Engineering

Type and level of study: Bachelor academic studies

Course: Sensors and actuators

Lecturers: Milan S. Matijevic, Vesna M. Rankovic, Slobodan R. Savic, Nenad D. Filipovic

Status of course: Obligatory for module M_5, VI semester

Number of ECTS: 6

Prerequisite: none

The course objective:
Students will have general theoretical knowledge and practical skills in the field of sensors and actuators.

The course outcome:
Understanding of structure, model, general characteristics, functioning principles and implementation of representative categories o sensors and actuators.

Syllabus:
Theory
1. Introduction. Terminology. Structures of systems that include sensors and actuators. Static and dynamic characteristics of sensors and actuators. 2) Criteria for selection of sensors. Systems for acquisition and data processing. 3) Measurement of movement, velocity, acceleration, vibration. 4) Measurement of force and tension. Measurement of pressure. 5) Measurement of temperature. 6) Actuators. 7) Electromechanic actuators. Electro-magnets. 8) Electric motors. 9) Hydraulic actuators. 10. Hydraulic components. Functional and technical characteristics. 11) Pneumatic actuators. 12. Pneumatic components. Functional and technical characteristics. 13) Non-conventional actuators. 14) Actuators as components of systems. 15) Diagnostics of failure of sensors and actuators.
Practice: Practical classes, other classes
Listed issues will be presented during laboratory exercises working in class with laboratory equipment (implementation of sensors and actuators) and computers (modeling and simulation)

Recommended reading:
1. Matijevic M., Jakupovic G. Car J. "Computer supported measurement and control" Faculty of Mechanical Engineering, Kragujevac, 2005.
2.Grujovic A.: Technical measurement I, Kragujevac, 2002
3. Grujovic A., Grujovic N.: Technical measurement II, Kragujevac, 2007
4. Grujovic A. Grujovic N.: Technical measurement III, Kragujevac, 2007

The number of hours of active teaching:				Other classes:
Theory: 3	Practical classes: 1,6	Other forms of teaching: 0,4	Research study: 0	1

Methods of teaching
Teaching with ex-cathedra approach with multimedia presentations and interactive work with students. Auditoria exercises combine ex cathedra approach and computer tools. Laboratory exercises refer to fileds of implementation of sensors and actuators.

Evaluation of knowledge (maximal 100 points)

Pre-final exam obligations	**Points**	**Final exam**	**Points**
Activities during the classes	5	Written	
Activities during the exercises		Oral presentation	45
Tests:			
Seminars:	50		