



## COURSE DATASHEET

<b>Semester:</b>	2013/14/1
<b>Course:</b>	Sensors and Actuators
<b>Code:</b>	VEMKFIB114M
<b>Responsible department:</b>	Institute of Physics and Mechatronics
<b>Department code:</b>	MKFI
<b>Responsible instructor:</b>	dr. István Szalai

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### Course objectives:

The main objectives of this subject is to recognize the elements of sensors and actuators

### Course content:

Lecture 1. Introduction to sensors and transducers, basics and application 2-3. Variable resistance sensors and transducers, sensor interface circuits, measurement errors 4-5. Inductive transducers and sensors, measurement errors and limits 6. Characteristics of piezoelectric transducers, signal conditioning for piezoelectric sensors 7-8. Optoelectric sensors; electrical properties of photodiodes, signal conditioning, measurement errors 9. Electrical and mechanical properties of switches and microswitches 10-11. DC and AC motors, equivalent circuits, characteristics, control circuits 12-13. Classification of stepper motors, electrical and mechanical properties, characteristics, control circuits, industrial applications 14. Electronically commutated motors 15. Piezoelectric and memory alloy actuators Laboratory 1. Laboratory safety training 2. Measurement data processing and representation 3. Potentiometric displacement sensors 4. Rotary sensors 5. Sensor for measuring magnetic field strength 6. Photoelectric proximity switch 7. Ultrasonic sensor 8. Inductive proximity switch 9. MEMS accelerometers 10. DC motor drives 11. Sensors for temperature measurement 12. Strain gauge 13-14. Most important properties of the stepper motors. Typical characteristics, control circuits 15. Written examination

### Requirements, evaluation and grading:

exam

### Required and recommended readings:

Tanszéki előadásvázlat. T. Fukoda and W. Menz: Handbook of sensors and actuators, (Elsevier 1998) Lambert Miklós: Mérőérzékelők (Integra-projekt Kft. Bp. 1993). Hahn-Harsányi-Lepsényi-Mizsei: Érzékelők és beavatkozók (Műegyetemi Kiadó, 1999) Janocha: Aktoren (Springer Verlag, 1998). Helmut Moczala: Törpe villamos motorok és alkalmazásaik (Műszaki Könyvkiadó, Bp. 1984)