

Course title: Robots, actuators and sensors	Neptun code: GESGT407a
Course coordinator: Dr. László Rónai, assistant professor, PhD	
type and number of lesson: lecture /seminar/practical lesson/consultation, 2 / week or semester	
method of accountability: colloquium	
curriculum location of the subject: spring	
pre-study conditions:	
The task and purpose of the subject:	
The student should get to know the operating principle of switch-type sensors, their hysteresis property, their application possibilities, as well as the actuators used and the properties and operation of the related actuator chains.	
Course description:	
<p>Classification of sensors. Description of the operating principles of industrial sensors: inductive, capacitive, magnetic, optical, ultrasonic sensors. Presentation of application areas and installation conditions through practical examples. Overview of methods suitable for road measurement. General principles of operation of electric motors. Classification of each type. Performance drives, kinematic drives. Power and torque limit diagrams for engines and transmissions. Presentation of types of planetary gears, determination of gear ratio using the principle of superposition. Bearings for power drives, with particular attention to accuracy.</p> <p>Discussion of different movement transformation types (rotating-rotating, rotating-progressive, progressive-rotary, progressive-progressive). Actuator chains and their elements. Comparison of mechanical and electronic kinematic chains. Driving moving sled units. Gliding, rolling, aero- and hydrostatic lines. Method of structural construction of machines. Examples from the range of machine tools. Robot structures, applied building units and elements.</p>	
Required literature:	
<ol style="list-style-type: none"> 1. J. Fraden, Handbook of Modern Sensors. Cham: Springer International Publishing, 2016. doi: https://doi.org/10.1007/978-3-319-19303-8. 2. Robert H. Bishop: The Mechatronics Handbook, 2002 CRC Press, Boca Raton-London-New York-Washington, D.C. 3. T12.44 Drive Technology, Frequency Converter Technology, Leybold Didactic GmbH 	
Recommended literature:	
<ol style="list-style-type: none"> 1. Paul C. Crause, Oleg Wasynczuk, Scott D. Sudhoff: Analysis of Electric Machinery and Drive Systems, John Wiley & Sons, Inc.2002, ISBN 0-471-14236-X 2. Richard Crowder: Electric Drives and Electromechanical Systems, 2006. eBook ISBN: 9780080492643 	