

Course title: Kinematics and motion control of industrial robots	Neptun code: GEMRB405-a
Course coordinator: Tamás Szabó, Associate Professor, PhD.	
type and number of lesson: lecture, number of lessons per week: 2 lectures	
method of accountability: colloquium	
curriculum location of the subject: autumn	
pre-study conditions: -	
The task and purpose of the subject:	
The course provides knowledge about the kinematics and motion control of 6-degree-of-freedom robots used in industry.	
Course description:	
<p>Overview of basic concepts related to industrial robots. Classification of members and constraints of mechanisms. Classification of robots. Determining the position of an open kinematic chain robot as a function of joint angles using the Denavit-Hartenberg description method. The investigation of the singular position of robots. Velocity and acceleration state of robot arm. Solution methodology for the inverse kinematic task of industrial robots based on geometric approach. Basic relations of robot dynamics.</p> <p>Description of Fanuc LR Mate 200iC industrial robot with six degrees of freedom. Presentation and adjustment of coordinate systems of industrial robots. Online and offline programming options. Overview of movement instructions, their parameterization. Possibilities of using grippers and additional units.</p>	
Required literature:	
<ol style="list-style-type: none"> 1. M. W. Spong, S. Hutchinson, M. Vidyasagar: Robot Modeling and Control, Wiley, 2006. 2. T. R. Kurfess: Robotics and Automation Handbook, CRC Press LLC, 2005. 	
Recommended literature:	
<ol style="list-style-type: none"> 1. D. Schramm, M. Hiller, R. Bardini: Vehicle Dynamics, Springer, ISBN 978-3-540-36044-5, 2014. 2. C. W. de Silva: Mechatronics, An Integrated Approach, CRC Press, ISBN 0-8493-1274-4, 2005. 	