

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Mechanical Engineering									
Field of study	Mechanics							Degree level and programme type	Bachelor's degree/ Master's degree
Specialization/ diploma path	Mechatronics, Automation and Robotics							Study profile	
Course name	Interim Work, Project (Mechatronics, Automatics and robotics)							Course code	IS-MER0055S
								Course type	obligatory/elective
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
				30				No. of ECTS credits	3
Entry requirements	Mathematics, physics, information technologies								
Course objectives	To familiarize students with the automation and mechatronic design methods, tasks of the trajectory planning of mobile robots and industrial manipulators, direct and invers kinematics and dynamics tasks. Acquainting students with the existing controllers, mechatronic and gripping systems, parallel manipulators and medical robots. Introduction to the simulation and control methods of automation, mechatronic and robotic systems.								
Course content	Forward and inverse kinematics of Robots; transfer function; static and dynamic properties of elements of automation systems; basic elements of automatic control systems; mathematical description of mechatronic and automation systems; converting a flowcharts; controllers PID, P, PD, PI; control systems stability; constructing automation systems based on FESTO pneumatic elements; simulation of automation, mechatronic and robotic systems in MATLAB program system environment.								
Teaching methods	Lectures, laboratory and/or project classes								
Assessment method	lecture – written exam, oral exam, tests; laboratory/project classes – evaluation of reports, verification of preparation for classes, tests;								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	defines the basic concepts of automatic control							K_W25, K_U01	
LO2	understands the essence of the design of automation systems							K_W25, K_U01	
LO3	analyses the existing technical solutions							K_W25, K_U01	
LO4	understands the problems of automatics and robotics							K_W25, K_U01	
LO5	uses advanced software functions to perform a task							K_W12, K_U15	
LO6	able to work in a team							K_U02	
Symbol of learning	Methods of assessing the learning outcomes							Type of tuition during which the outcome is	

outcome		assessed	
LO1	defines the basic concepts of automatic control	P	
LO2	understands the essence of the design of automation systems	P	
LO3	analyses the existing technical solutions	P	
LO4	understands the problems of automatics and robotics	P	
LO5	uses advanced software functions to perform a task	P	
LO6	able to work in a team	P	
Student workload (in hours)		No. of hours	
Calculation	participation in classes, laboratory classes, etc.	30	
	preparation for classes, laboratory classes, projects, etc.	20	
	working on projects, reports, etc.	30	
	participation in student-teacher sessions related to the classes/seminar/project	10	
	implementation of project tasks	5	
	preparation for and participation in exams/tests	5	
	TOTAL:	100	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		40	
Student workload – practical activities		60	
Basic references	Shimon Y., Handbook of Automation, Springer, 2009. Ogata K., Modern Control Engineering, Prentice Hall, 2010		
Supplementary references	Monkman G.J, Hesse S., Steinmann R., Schunk H.: Robot grippers. Wiley, 2007 Craig J.J.: Introduction to robotics : mechanics and control. Pearson, Harlow 2004 www.mathworks.com/products/matlab/		
Organisational unit conducting the course	Department of Robotics and Mechatronics	Date of issuing the programme	
Author of the programme	Prof. Kanstantsin Miatluk, PhD, DSc.	19.03.2021	

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar