COURSE DESCRIPTION CARD

Faculty of Mechanical Engineering								
Field of study	**Automatic Control and Robotics Mechanics and Construction of Machinery Mechatronics**						**Degree level and programme type**	**Bachelor's degree Master's degree**
Specialization/ diploma path	**-**						**Study profile**	**general**
Course name	**Design of pneumatic system**						**Course code**	**IS-FME-00210S**
							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**	**6**

Entry requirements	
Course objectives	**Introduction students with the basic concepts of pneumatic drive and control of the pneumatic systems. Introduction with graphic symbols and naming of basic pneumatic elements used for designing drive systems. Teaching the principles of reading with the understanding of pneumatic diagrams of machine drives and industrial automation systems. Teaching the basics of designing drive and control systems of technological processes consisting of unified elements**
Course content	**Designing basic pneumatic manual control systems, control systems enabling changing the parameters of the piston movement of the actuator, systems performing logic functions, sequential control systems**
Teaching methods	**Multimedia design classes. Design system on computers**
Assessment method	**Project: observation of work, discussion, activity, report**

Symbol of learning outcome	**Learning outcomes**	**Reference to the learning outcomes for the field of study**
LO1	**student: names and classifies the basic components of pneumatic and hydraulic drive and control systems,**	**K_U03, K_U12**
LO2	**correctly reads and draws pneumatic diagrams of drive and control systems**	**K_U03, K_U12**
LO3	**correctly recognizes graphical symbols of pneumatic elements**	**K_U03, K_U12**
LO4	**able to work in a team**	**K_K04**
LO5		
Symbol of learning	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is**

outcome		assessed
LO1	project classes – observation of work, report	P
LO2	Project classes – observation of work, report	P
LO3	Project classes – observation of work, report	P
LO4	Project classes – observation of work, report	P
LO5		

Student workload (in hours)		No. of hours
Calculation	participation in project classes	30
	preparation for project classes	40
	preparation a report for the project	60
	participation in student-teacher sessions related to the project classes	40
	TOTAL:	170

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	70	6
Student workload – practical activities	100	

Basic references	1. Beater P.: Pneumatic Drives: System Design, Modelling and Control, Springer-Verlag, 2007. 2. Igor Lazar Krivts, German Vladimir Krejnin: Pneumatic actuating systems for automatic equipment structure and design, CRC Press, 2006. 3. Pneumatic and hydraulic symbols: British and International Standards e.g. BS 2917, PN-IS0 1219-2 (2009), ISO 9461 (Hydraulics), CETOP, RP68P, ISO 5599 (Pneumatics)
Supplementary references	Scientifics journals connected with pneumatic and hydraulic drive and control systems.

Organisational unit conducting the course	Department of Automatic Control and Mechatronic Systems	Date of issuing the programme
Author of the programme	Rafał Grądzki, Ph.D.	16.01.2023

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

S – seminar