

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Mechanical Engineering										
Field of study	Mechatronics							Degree level and programme type	Bachelor's degree/Master's degree/Doctoral degree	
Specialization/ diploma path								Study profile		
Course name	Microprocessor control systems							Course code	IS-FME-00252S	
								Course type	obligatory/elective	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer	
	30			30				No. of ECTS credits	4	
Entry requirements	Fundamentals of Electronics and Electro-technics, signal processing basics, computer programming									
Course objectives	Getting familiar with microprocessor control systems. Demonstration and practical implementation of control algorithms on microprocessor platforms and microcomputers. Getting to know embedded systems, their programming and operation.									
Course content	Lecture: Introduction to microprocessor technology and embedded systems, Linux and ROS basics, cross-compilers and IDE environments, GPIO port support, Serial communication interfaces, Network communication, Downloading and basic processing of single and multidimensional signals on microprocessor systems, programming and testing of basic algorithms control on microprocessor systems, programming and testing of basic filtration algorithms on microprocessor systems, tools for debugging and maintaining software compliance, microprocessor control systems in intelligent technical systems and IoT systems. Laboratory: Introduction to programming of single-chip computers (basic operation, programming, working in a terminal), remote communication with a single-chip computer (SSH), programming and servicing of GPIO ports (programming of diodes and diode arrays, programming of LCD displays, downloading data from sensors and filtering them - temperature sensors, humidity sensors, IMU spatial orientation sensors), programming simple control systems, image acquisition and processing on a microcomputer),									
Teaching methods	Information and case-studies lecture; Laboratory classes									
Assessment method	Lecture: two tests, Laboratory: assessment of entrance tests, reports, discussions and class activity									
Symbol of	Learning outcomes							Reference to the		

learning outcome		learning outcomes for the field of study	
L01	knows the methods and techniques of programming and signal processing in microprocessor control systems		
L02	knows and uses programming tools to design and configure microprocessor control systems		
L03	can work individually and in a team on the microprocessor control system software and knows the basic programming tools to control the software version		
L04	can obtain information from the literature and catalogue notes of microprocessor controllers, can integrate the obtained information, interpret it		
L05	is ready to critically assess own knowledge and improve professional qualifications and self-education;		
L06	is able to work in a team and as a team design and program microprocessor control systems		
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	Lecture: two tests;	W	
L02	Lecture: two tests;	W	
L03	Laboratory: assessment of entrance tests, reports, discussions and activity in the classroom;	L	
L04	Lecture: two tests; Laboratory: assessment of entrance tests, reports, discussions and activity in the classroom;	W, L	
L05	Laboratory: assessment of entrance tests, reports, discussions and activity in the classroom;	L	
L06	Laboratory: assessment of entrance tests, reports, discussions and activity in the classroom;	L	
Student workload (in hours)		No. of hours	
Calculation	Participation in lectures	30	
	Participation in project classes	30	
	Preparation for the lecture exam; attendance at the exam	17	
	Preparation for project classes	14	
	Performing design tasks (including preparation of a presentation)	5	
	Participation in consultations	4	
	TOTAL:	100	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		64	2,6

Student workload – practical activities		51	2
Basic references	M. G. HartleyM. HealeyP. G. Depledge, Mini and Microcomputer Systems, 1988 Naresh K. Sinha, Microprocessor-Based Control Systems, 1986 Dogan Ibrahim, Microcontroller Based Applied Digital Control, 2006		
Supplementary references	R. Iserman, Digital Control Systems, 2nd ed., 1989		
Organisational unit conducting the course	Department of Robotics and Mechatronics	Date of issuing the programme	
Author of the programme	Leszek Ambroziak, Dr. Eng.	20.03.2021	

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

S – seminar