

SYLLABUS

Course description

Course code		Course	STEROWNIKI PRZEMYSŁOWE PLC		
ME/O/1/ST/B18			INDUSTRIAL CONTROLLERS PLC		
Language of instruction		English			
Academic year		2025/2026			
field of study:		Mechanical engineering			
field of specialisation:		All			
Educational level		first-cycle studies			
Education profile		General academic			
Mode of study		Full-time studies			
Semester(s)		5			
Affiliation with a group of classes		B. Core subjects			
Course status		Obligatory			
Types of classes, instruction hours, ECTS credits		Types of classes	Number of instruction hours	Number of ECTS credits	
		Lecture	15[h]	2 ECTS	
		Classes	15[h]		
Linkage of the course	with the education profile	related to the conducted scientific activity in the discipline to which the field of study is assigned			2 ECTS
	with qualifications	it serves the student's acquisition of engineering competences			2 ECTS
	with science discipline	Mechanical engineering			2 ECTS
Form of teaching		Traditional – classes organized at the University /classes conducted using online learning methods and techniques			
Prerequisites		Electrical engineering and electronics, Mechatronics and automatics			
Department		Faculty of Mechanical Engineering, UTH Rad			
Coordinator		Dr hab. inż. Andrzej Puchalski, prof. UTH			
The website of the basic organizational unit		http://wm.uniwersytetradom.pl			
E-mail address, phone number of the coordinator		andrzej.puchalski@urad.edu.pl			

LEARNING OUTCOMES, CURRICULUM CONTENT, TEACHING CLASSES, VERIFICATION OF LEARNING OUTCOMES

Learning Objective:	Knowledge of the role of industrial PLCs in the automation and robotics systems. Ability to write and test control programs.
Curriculum Content:	<p>LECTURE Manufacturers and families of industrial controllers. SIMATIC range of controllers. Programming concepts - EN 61131 standard (2h). Basic and extended programming instructions (6h). PLC in Integrated Engineering. Selected communication standards. Embedded web server (3h). HMI. Elements of visualization of the control process. Supervision and data acquisition systems SCADA (4h).</p> <p>LABORATORY Programming and commissioning of PLC controllers with models of electropneumatic and drive systems (10h). Tests PLC programs in the simulator environment (5h)</p>
Didactic (educational) methods:	<ul style="list-style-type: none"> • problem methods (problem lecture, conversational lecture), • simulation methods, • practical methods (demonstration, laboratory exercises, project method, simulation)
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	<p>The condition for passing the course is to achieve all the required learning outcomes specified for the subject.</p> <p>Lectures are passed on the basis of a written test.</p> <p>Completion of the laboratory requires the performance of exercises and obtaining positive grades from entrance cards and reports.</p> <p>The method of calculating the final grade for the course is specified in the regulations.</p>

Learning outcomes for the course in relation to the field of study learning outcomes and the type of classes				Methods of verifying learning outcomes	
Learning outcome number	Description of the learning outcomes for the course (PEU) A student who has passed the course (W) knows and understands / (U) can / (K) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment
W1	Knows of the principles of configuration and programming of industrial PLC controllers.	K_WG18	Lecture	Test	Pass a subject
U1	Can program and tests mechatronic systems with PLC controllers for various physical processes.	K_UW06	Lecture/lab	Test	Pass a subject
K1	Is ready to supplement and critically evaluate specialist knowledge and is able to select appropriate sources of knowledge and learning methods.	K_KK01 K_KK02	Lab	Test	Pass a subject

Literature and teaching aids
<ol style="list-style-type: none"> 1. Simatic S7-1200- getting started, Siemens 2009 2. S7-1200 Programmable controller System Manual, Siemens 2022 3. WindLDR Ladder Programming Manual, IDEC Corporation 2019 4. S7-200 Programmable Controller System Manual, Siemens 2008 5. S7-1200 CPU 1212/1215C Datasheet 6. Lecture and tutorial materials, Puchalski A., E-script: Lab. Mechatronics UTH Radom 2023 7. S7-1500 Getting started Tutorial. Siemens S7-1500

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits	
Attendance, participation	Student workload [h].

	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in lectures/classes/lab	X	15 [h] / 15 [h]
Preparation for lectures/classes/lab , Preparation for ... credit / exam	5 [h] / 10 [h] 5 [h] / 0 [h]	X
Total student workload Preparation for ... credit / exam	20 [h]/ 0,8 ECTS	30 [h]/ 1,2 ECTS
ECTS points per subject	2 ECTS	

Additional information, comments
<p>In the case of students with special needs, including disabilities, and chronic illnesses, the methods and forms of verification of learning outcomes specified above (in the syllabus) are adapted to the individual needs of these students, as appropriate.</p> <p>Detailed rules and forms of support for students with special needs, including those with disabilities and chronically ill, during classes, credits, and exams are specified in: University Regulations (Regulamin Studiów Uniwersytetu Technologiczno-Humanistycznego w Radomiu), Study Regulations (Zasady Studiowania), and Procedure for Ensuring Accessibility of the Educational Process to Students with Special Needs, Including Those with Disabilities and Chronically ill (Procedura dotycząca zapewnienia dostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekle chorych).</p>

