Title of Course	Automation of Mechanical Systems		
Semester	Autumn		
Teaching Hours per Course:	Total	- Lectures:	- Tutorials:
	60	30	30
ECTS Credits	5		
The content of education			
Aims of Course	The aim of the course is to acquire basic knowledge of the construction of microprocessor systems and PLC programmable controllers. Students gain the basics of programming controllers and their use for automatic control of industrial processes.		
Program	Lectures Basic elements of digital technology: asynchronous and synchronous triggers, adders, comparators, registers, counters. Architecture of 8-bit microcontrollers. Basics of microcontroller programming in assembler language. Characteristics of PLC programmable controllers. PLC programming languages. Characteristics of measuring transducers and executive systems. Applications of microprocessor systems in the automation of mechanical systems. Introduction to SCADA systems. Laboratories Contactor-relay control systems with an electric drive. Designing of automatic control systems for the heat transfer process using measuring cards. Basics of 8051 family microcontroller programming. Basics of programming microcontrollers of the AVR family. Control systems for stepper motors. Programming of PLC controllers. Programming of time circuits in a PLC. PID controller implemented programmatically on the PLC. PLC communication with the SCADA system.		
Conditions of completion	The condition for passing the lectures is to obtain a positive grade from two written tests on issues discussed during lectures. The condition for passing laboratory classes is to obtain positive marks from written tests of individual laboratory exercises.		
Teacher	Mariusz Szreder		