

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Introduction to programming of PLC controllers		Code 1010324381010326915
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 8
Elective path/specialty Measurement Systems in Industry and	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 9 Classes: - Laboratory: 18 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Arkadiusz Hulewicz email: arkadiusz.hulewicz@put.poznan.pl tel. 616652546 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge in the scope of electrotechnics, metrology and computer science Basic knowledge in the scope of electronics, including electronic analog and digital circuits
2	Skills	Ability of the efficient self-education within the scope of PLC controllers programming
3	Social competencies	Awareness of the necessity of broadening of the competencies in the field of electrical engineering and willingness to cooperate in a team
Assumptions and objectives of the course: - Basic knowledge of programming of the selected PLC controllers - Knowledge of interdisciplinary achievements related to industrial applications of PLC controllers		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Ability to describe importance and application possibilities of the modern measuring systems - [K_W05 +] 2. Ability to explain the principles and techniques of measuring signal acquisition for industrial applications - [K_W07 +++]		
Skills: 1. Ability to work independently and as a team in the design and construction companies as well as in the industrial centres - [K_U05 +, K_U23 +] 2. Ability to design the measuring systems creatively, using possibilities offered by new technologies - [K_U22 +]		
Social competencies: 1. Ability to think and act enterprisingly in the area of measuring systems used in industry - [K_K01 +] 2. Understanding the necessity of broad popularization of the knowledge concerned with the simple and complex measuring systems - [K_K05 +]		
Assessment methods of study outcomes		

<p>Lectures:</p> <ul style="list-style-type: none"> - evaluation of the knowledge related to the content of lectures (test, computational and problem questions), awarding marks in laboratory exercises) - continuous estimation in all classes (awarding attendance in lectures, activity and quality of perception). <p>Laboratory exercises:</p> <ul style="list-style-type: none"> - continuous estimating with the tests, - awarding the skill increase, - the evaluation of knowledge and skills connected with the measuring tasks and prepared reports. 		
Course description		
<ul style="list-style-type: none"> - Structure of the measuring systems using PLC controllers. - Programming languages of PLC controllers: diagrams and instructions. - Fundamentals of programming, operations on the data, signal processing, controllers communications. - Examples of measuring systems configurations with the use of a PLC controller. 		
Basic bibliography:		
<ol style="list-style-type: none"> 1. R. Sałat, K. Korpysz, P. Obstawski, Wstęp do programowania sterowników PLC, WKŁ, Warszawa 2010. 2. J. Kasprzyk, Programowanie sterowników przemysłowych, WNT, Warszawa 2006. 3. A. Król, J. Moczko-Król, S5/S7 Windows Programowanie i symulacja sterowników PLC firmy Siemens, Nakom, Poznań 2002. 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. U. Tietze, Ch. Schenck, Układy półprzewodnikowe, WNT, Warszawa 1993. 2. J. Bogusz, Lokalne interfejsy szeregowo w systemach cyfrowych, Wyd. BTC, Warszawa 2004. 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	9	
2. Participation in laboratory exercises	18	
3. Participation in consulting with lecturers	3	
4. Preparation to laboratory exercises and preparation of the reports	18	
5. Preparation to the credit	17	
Student's workload		
Source of workload	hours	ECTS
Total workload	65	2
Contact hours	32	1
Practical activities	30	1