STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Programmable logic controllers	**1010311371010321903**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(brak)**	**4 / 7**

Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Microprocessor Control Systems in	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time, part-time)
First-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **15** Classes: **-** Laboratory: **15** Project/seminars: **15**				**5**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %**)**
technical sciences	**5 100%**
Technical sciences	**5 100%**

Responsible for subject / lecturer:	Responsible for subject / lecturer:
dr inż. Michał Krystkowiak email: Michal.Krystkowiak@put.poznan.pl tel. 061 665 2388 Electrical ul. Piotrowo 3A, 60-965 Poznań	dr inż. Michał Krystkowiak email: Michal.Krystkowiak@put.poznan.pl tel. 061 665 2388 Electrical ul. Piotrowo 3A, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	He knows the rules and parameters of programmable logic controllers PLC. He knows the tools and runtime systems selected PLC programming languages. Basic knowledge of automation.
2	**Skills**	Know how to program and operate at a general level programmable logic controllers
3	**Social competencies**	He can think and act in an entrepreneurial manner in the design of industrial automation systems

Assumptions and objectives of the course:

Getting familiar with the operation, maintenance and programming of PLCs. Acquisition of the ability to design industrial automation systems.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Should be able to: describe the principles of operation of real-time systems, including systems based on programmable logic controllers PLC and indicate their industrial applications - [K_W04+, K_W07++, K_W22+++]

2. Should be able to: choose programming languages??, tools, runtime and communication protocols PLC - [K_W10++, K_W11+, K_W22+++]]

Skills:

1. Will be able to: apply knowledge of such industrial automation to develop and implement specific algorithms PLC   - [K_U03 ++, K_U17 ++]

2. Will be able to: apply the selected simulation tools and development environments to support design automation systems - [K_U03 ++, K_U07 ++, K_U13+++]

Social competencies:

1. He can think and act in an entrepreneurial manner in the design of electronic systems-processor - [K_K02 ++]

Assessment methods of study outcomes

Lecture:

- assess the knowledge and skills listed on the written exam with a test and problematic, continuous evaluation for each course (rewarding activity and quality perception)

Design classes and laboratory exercises:

- test and favoring knowledge necessary for the accomplishment of problems in the area of tasks in the laboratory,

- continuous evaluation, rewarding gain skills they met the principles and methods

- assess the knowledge and skills related to the implementation of laboratory exercises, the evaluation report made ??exercise.

Get extra points for the activity in the classroom, and in particular for:

- propose to discuss further aspects of the subject,

- the effectiveness of the application of the knowledge gained during solving the given problem,

- ability to work within a team performing a task specific practice in the laboratory.

Course description

Update 2017: the concepts of real-time system and programmable PLC, application possibilities PLC systems, architecture of programmable industrial controllers and their classification, characteristics of the program cycle, programmable logic controllers, PLC runtime tools - programming languages (LAD, STL, FBD). Characteristics of basic PLC expansion modules, complex systems, programmable logic controllers - communication protocols, visualization and process control automation from a PC.

Basic bibliography:

1. Kwaśniewski J., Sterowniki PLC w pracy inżynierskiej, PTC, Kraków 2008.

2. Legierski T., Programowanie sterowników PLC, WPKJS, Gliwice 1998.

3. Dokumentacja techniczna sterownika PLC Simatic S7-200 firmy SIEMENS 2016

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)

Student's workload

Source of workload	hours	ECTS
Total workload	70	5
Contact hours	48	3
Practical activities	35	3