

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Selected problems of application of programmable controllers</b>		Code <b>1010335111010335117</b>
Field of study <b>Control Engineering and Robotics</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>15</b> Classes: <b>-</b> Laboratory: <b>15</b> Project/seminars: <b>10</b>		No. of credits <b>6</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>6 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Stefan Brock email: Stefan.Brock@put.poznan.pl tel. 48 61 665 2627 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	K_W04: K_W07:
2	<b>Skills</b>	K_U04: K_U07:
3	<b>Social competencies</b>	K_K01:
<b>Assumptions and objectives of the course:</b> The aim of the course is to extend and deepen the knowledge about construction, programming methods and typical applications of programmable controllers (PLC) and fieldbusses . Student at the end of training should be able to design and program systems with PLC. Students can also choose properly the fieldbus to a particular object technology.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. K_W06 - [K_W06]		
2. K_W02 - [K_W02]		
<b>Skills:</b>		
1. K_U05 - [K_U05]		
2. K_U09 - [K_U09]		
<b>Social competencies:</b>		
1. K_K03 - [K_K03]		
<b>Assessment methods of study outcomes</b>		
Lecture: Assessment of the lecture is written exam of based on design case solution.		
Laboratory: Assessment of laboratory requires doing indicated exercises and giving reports		
Projects: Design of the control system with the selection of required equipment		
<b>Course description</b>		

<p>PLC hardware: controller architecture, input and output modules, function blocks, PLC family. Integrated sensor for temperature, pressure, level and other process parameters. PLC programming according to IEC 61131. Programming Languages: function blocks, ladder logic, sequential functional chart, structured text. Implementation of typical structures of automation. Operator panels. Analysis of algorithms used in industrial controllers. Laboratory exercises illustrate the issues discussed during the lectures.</p>		
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Lecture materials provided by the teacher in electronic form</li> <li>2. Hugh Jack, P.Eng. Michigan, USA: Automating Manufacturing Systems with PLCs (free on-line access)</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>1. Technical documentation PLC and industrial controls manufacturers</li> <li>2. Kasprzyk J.: Programowanie sterowników przemysłowych, Wydawnictwa Naukowo-Techniczne</li> </ol>		
<p><b>Result of average student's workload</b></p>		
<p><b>Activity</b></p>	<p><b>Time (working hours)</b></p>	
1. Lectures	15	
2. Laboratory exercises.	15	
3. Design excercises	10	
4. Consultations and examination	3	
5. Preparation to design and laboratory exercises, and elaboration of reports	40	
6. Preparation to tests and examination	30	
<p><b>Student's workload</b></p>		
<p><b>Source of workload</b></p>	<p><b>hours</b></p>	<p><b>ECTS</b></p>
Total workload	113	6
Contact hours	43	3
Practical activities	70	3