

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject SCADA systems and PLCs		Code 1010321271010326004
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Electrical and Computer Systems in	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: - Classes: - Laboratory: 2 Project/seminars: 1		No. of credits 5
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 %) 5 100% 5 100%
Responsible for subject / lecturer: Dr inż. Grzegorz Trzmiel email: grzegorz.trzmiel@put.poznan.pl tel. 616652693 Elektryczny Piotrowo 3A, 60-965 Poznań		Responsible for subject / lecturer: Mgr inż. Damian Głuchy email: damian.gluchy@put.poznan.pl tel. 616652693 Elektryczny Piotrowo 3A, 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of electrical engineering, electronics and computer science.
2	Skills	Basics of programming in C, Pascal or other high-level language.
3	Social competencies	He is aware the need to expand his competence, ready to to cooperate within a team.
Assumptions and objectives of the course: The objective of the course is to familiarize students with the principles of designing, constructing and operation of a control and a visualization system, configuration of the elements of a system and capabilities of SCADA environments. Another objective is getting familiar with the possibility to work in simulation mode and with a real object monitored by PLC driver. Design his own visualization and control project. Presentation of solution.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. it has an elementary knowledge of the use of IT tools in SCADA systems in programming with dedicated languages, design of signal transmission network and use of databases - [K_W11++] 2. it has an elementary knowledge of the structure, operation and selection of the PLC (including simulated) cooperating with the visualization and control SCADA systems - [K_W22++] 3. it has a basic and systematic knowledge of the design and programming of microprocessor and PLC used in industrial process control - [K_W07+]		
Skills: 1. he can formulate a process control algorithm and implement it using appropriate programming languages - [KU_04+++] 2. he is able to simulate real operating conditions and parameters of an industrial process using SCADA system - [KU_02+++] 3. he knows how to correctly select the design objectives and make a presentation showing the characteristics of the proposed SCADA system - [KU_12+]		
Social competencies: 1. he is aware importance of their own work and teamwork, can be responsible for implemented design tasks - [K_K03+++]		

Assessment methods of study outcomes		
<p>Laboratories: ? continuous evaluation for each course - rewarding growth of skills in using the rules and methods, ? evaluate the knowledge and skills under the project first completion.</p> <p>Projects: ? implementation and presentation of the project visualization and control of the process, ? ability to cooperate within a team implementing practically design task, ? presentation of the current progress of the project.</p>		
Course description		
<p>Topics concerning the laboratory part of the course include: configuration of the communication with external devices, creation of synoptic screens, defining variables, configuration of alarms, charts (trends), recording events, elements of programming, securing the system from unauthorized access (configuration of users and systems of privileges), servicing of events, reports, keyboard shortcuts, work with actual driver and familiarizing with other chosen elements of SCADA system. During the project activities visualization and steering drafts in simulation or real-time mode are being made. Every project is additionally shown in a form of presentation.</p> <p>Laboratory: practice using of functionality and possibilities of the system, computer classes covering a range of topic. Designing: Individual project / team with the current presentation of the objectives and progress in the implementation.</p>		
Basic bibliography:		
<p>1. Cupek R.: "Metody wizualizacji rozproszonych procesów przemysłowych. Praca doktorska", Politechnika Śląska, Gliwice 1998. 2. Jakuszczyński R.: "Programowanie systemów SCADA", PKJS, Gliwice 2006.</p>		
Additional bibliography:		
<p>1. CiTechnologies: "System pomocy środowiska CitectSCADA", CiTechnologies, Warszawa 2006-2012. 2. CiTechnologies: "Quickstart Tutorial. CitectSCADA", CiTechnologies, Warszawa 2006-2010. 3. Internet. 4. Diploma theses of IEEP</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. participation in laboratory classes	30	
2. participation in project activities	15	
3. the consulting	20	
4. preparation for active participation in laboratory classes	20	
5. preparation for presentations in class project	10	
6. implementation of projects	30	
7. preparation for the pass the project	10	
8. reckoning projects	3	
Student's workload		
Source of workload	hours	ECTS
Total workload	138	5
Contact hours	68	3
Practical activities	108	4