

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Computer Control Systems		Code 1010332211010331400
Field of study Automatic Control and Robotics	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: - Project/seminars: 30		No. of credits 4
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		ECTS distribution (number and %)
Responsible for subject / lecturer: Dr inż. Jarosław Warczyński email: jaroslaw.warczyński@put.poznan.pl tel. 61 665 2374 Wydział Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K1_W13 K1_W10
2	Skills	K_U03: K_U01:
3	Social competencies	K1_K04:
Assumptions and objectives of the course: The goal of the subject is an introduction to computer technologies establishing the real strength of computer control systems - mainly technologies of integration which allow to build big, cooperative systems with the ability of exchanging information, dedicated to coordinated control of huge systems.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. K_W02 - [K_W02]		
Skills:		
1. K_U06 - [K_U06]		
Social competencies:		
1. K_K02 - [K_K02]		
Assessment methods of study outcomes		
Written exam (checking of theoretical knowledge)		
Project: Assessment of students? projects from the framework of computer control system integration.		
Course description		

Lecture: Justification of computer control systems demand ? hierarchical and distributed systems, for example MES (Manufacturing Execution Systems), necessity of linking control and management systems. Integration of control subsystems as a specific feature of computer control systems. Technologies of integration: DDE (Dynamic Data Exchange) technology, COM (Component Object Model) and DCOM (Distributed COM), RPC (Remote Procedure Call), XML services of WEB, OPC (OLE for Process Control) standard, OPC UA (Unified Architecture). Introduction to projects from the framework of DDE, OPC and WWW applications for data exchange between PLC and user application.

Project: Project tasks consist in setting servers of DDE, OPC and WWW and establishing data exchange between PLC and SCADA self-constructed SCADA application.

Basic bibliography:

1. Lange, J., Iwanitz, F.: OPC. Fundamentals, Implementation and Application. Huethig, Hedelberg, 2006.
2. Fryźlewicz, Z., Salamon, A.: Podstawy architektury i technologii usług XML sieci WEB. PWN, 2008.
3. Tanenbaum, A. S., M. van Steen: Systemy rozproszone, Zasady i paradygmaty. WNT, 2006.
4. Grega, W.: Metody i algorytmy sterowania cyfrowego w układach scentralizowanych i rozproszonych. Wyd. AGH, Kraków, 2004.

Additional bibliography:

1. <http://www.opcfoundation.org/>
2. <http://www.mesa.org/>
3. 3. <http://www.isa.org/>

Result of average student's workload

Activity	Time (working hours)	
1. Exam	15	
2. Project	45	
Student's workload		
Source of workload	hours	ECTS
Total workload	120	4
Contact hours	60	0
Practical activities	30	0