

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Fieldbusses and distributed control systems		Code 1010331171010335158
Field of study Control Engineering and Robotics	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty -	Subject offered in: polish	Course (compulsory, elective) elective
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: - Laboratory: 2 Project/seminars: -		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		ECTS distribution (number and %) 5 100%
Responsible for subject / lecturer: dr inż. Stefan Brock email: Stefan.Brock@put.poznan.pl tel. 48 61 665 2627 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W17: K_W18: K_W22:
2	Skills	K_U10: K_U14: K_U18:
3	Social competencies	K_K01:
Assumptions and objectives of the course: The aim of the course is to understand the theoretical foundations, principles and typical applications of the fieldbusses and distributed control systems. Student at the end of training should be able to choose the appropriate fieldbus to a particular object technology. Students can also choose appropriately distributed control system.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. K_W18 - [K_W18] 2. K_W21 - [K_W21] 3. K_W13 - [K_W13]		
Skills:		
1. K_U13 - [K_U13] 2. K_U18 - [K_U18] 3. K_U17 - [K_U17]		
Social competencies:		
1. K_K02 - [K_K02]		
Assessment methods of study outcomes		
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		

Course description		
<p>Implementation of typical automation structures. PLC communication systems. Analysis of the fieldbuses in the schema ISO-OSI layer model. Examples of the construction, operation and use of the busses: AS-i, Modbus, CAN, Profibus, HART, Ethernet Powerlink. Description of the operation and use of the structure of industrial communication through a Wide Area Network. The use of network protocols SMTP, FTP, HTTP to remote management of the control system. Distributed control systems (DCS) in process control systems. DCS System Structure: Object equipment, wiring, actuators, process stations, operator and engineering stations. Continuous process control algorithms - PID elementary modifications, the specifics of distributed control. Analysis of commercial solutions - Honeywell - Experion, Siemens - PCS7, Emerson - Delta. Additional features of the DCS: autotuning, system diagnostics. Laboratory exercises illustrate the issues discussed during the lectures.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Due to the lack of widely available literature, lecture material, published on the Internet and web sites various are the basis material. 2. Zimmermann W., Schmidgall R.:Magistrale danych w pojazdach. Protokoły i standardy, Wydawnictwa Komunikacji i Łączności 2008 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Technical documentation by Honeywell, Siemens, Emerson 		
Result of average student's workload		
Activity	Time (working hours)	
1. Lectures	30	
2. Laboratory exercises.	30	
3. Consultations and examination	5	
4. Preparation to laboratory exercises and elaboration of reports.	40	
5. Preparation to tests and examination.	20	
Student's workload		
Source of workload	hours	ECTS
Total workload	125	5
Contact hours	65	2
Practical activities	60	2