



The Faculty of:	Faculty of Electrical and Computer Engineering
Field of study:	Electrical Engineering
Speciality:	EA
Study degree (BSc, MSc):	Second circle Master's degree full time studies (MSc)

COURSE UNIT DESCRIPTION

Course title:	Advanced method programming of PLC controllers
Lecturer responsible for course: Lesław Gniewek, PhD.	
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Department : Department of Computer and Control Engineering	

Semester	Weekly load	Type of classes				Number of ECTS credits
		L Lectures	C Theoretical Classes	Lb Laboratory	P Project	
2	5/3	25	-	25	-	3

Course description
<p>Lecture:</p> <ol style="list-style-type: none"> 1. Introduction, systems bits in Schneider TSX Micro controller. 2. Multitask structure in Schneider PL7 software. 3. Organization blocks in Siemens Step7 software. 4. System functions and processing of interruptions in Simatic S7 controllers. 5. Special memory bits in Simatic S7-200 controllers. 6. PLC with GSM-communication. 7. Introduction to fuzzy logic, fuzzy sets and their property. 8. Fuzzy relations, fuzzy implications. 9. Structure of fuzzy controller, Mamdani fuzzy controller, Takagi–Sugeno fuzzy controller. 10. IEC 61131-7 norm and review of „fuzzy” software in PLC. 11. Fuzzy Petri net - definitions, algebraical description and property. 12. The method of fuzzy Petri net synthesis, practical applications of fuzzy nets in control systems.
<p>Classes:</p> <p>-</p>
<p>Laboratory:</p> <ul style="list-style-type: none"> • Programming of Schneider TSX Micro controller. • Programming of Siemens Simatic S7-214 controller. • Programming of Siemens Simatic S7-314 controller.

Project:

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Objectives of the course

Student should obtain extended knowledge about programming PLC controllers.

Examination method

Laboratory: Written test and short questions before every lab.

Bibliography

1. Legierski T., Kasprzyk J., Hajda J., Wyrwał J., „Programowanie sterowników PLC”, Wyd. Prac. Komp. J. Skalmierskiego, Gliwice, 1998.
2. Kasprzyk J. „Programowanie sterowników przemysłowych”, WNT, Warszawa, 2006.
3. Pietrusiewicz K., Dworak P., „Programowalne sterowniki automatyki PAC”, Wyd. Nakom, Poznań, 2007
4. Seta Z., „Wprowadzenie do zagadnień sterowania: wykorzystanie programowalnych sterowników logicznych PLC”, Mikom, Warszawa, 2002.
5. Król A., Moczko-Król J., „S5/S7 Windows: programowanie i symulacja sterowników PLC firmy SIEMENS”, Wydawnictwo Nakom, Poznań, 2000.
6. Kwaśniewski J., "Sterowniki PLC w praktyce inżynierskiej", Wyd. BTC, Legionowo, 2008.
7. Driankov D., Hellendoorn H., Reinfrank M., „Wprowadzenie do sterowania rozmytego”, WNT, W-wa, 1996.
8. Rutkowska D., Piliński M., Rutkowski L., „Sieci neuronowe, algorytmy genetyczne i sterowanie rozmyte”, PWN, Warszawa-Łódź, 1997.
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10. Strony internetowe: www.abmicro.pl, www.astor.com.pl, www.elmark.com.pl, www.gefanuc.com, www.modicon.com, www.sabur.com.pl, www.saia-burgess.com, www.schneider.pl, www.siemens.pl, www.ad.siemens.de.

Lecturer signature	
Head of Department signature	
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