POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Standard SCADA systems [S1Elmob1>PO9-SCADA]

Course

Field of study
Electromobility

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
0

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

The student starting this course should have basic knowledge of electrical engineering, metrology and computer science, and electronics. He should also have the ability to effectively self-educate in the field of PLC programming and be able to work in a laboratory group.

Course objective

Expanding knowledge on programming PLC controllers with emphasis on issues related to visualization and remote access to the PLC managed control system Provide students with detailed knowledge of SCADA systems programming and familiarization with interdisciplinary achievements in the field of using SCADA systems for industry.

Course-related learning outcomes

Knowledge:
1. knows the structure and operation of electronic and optoelectronic systems
2. has general knowledge of PLC controllers and SCADA systems
3. has knowledge in the design and programming of PLC-based control process visualization systems
4. has knowledge in LabVIEW programming

Skills:
1. knows how to use properly selected methods and tools to design SCADA visualization systems
2. can creatively program elements of SCADA visualization of measurement systems, using the possibilities offered by new technologies
3. knows how to program in LabView visualization systems cooperating with the PLC controller

Social competences:
1. understands that the knowledge of programming elements of the control systems visualization is necessary in the work of an engineer

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Laboratory: the skills acquired during laboratory exercises are verified on the basis of reports on the operation of miniature simulators of real actuator systems programmed by students. Exercises are held in 3 cycles. During the laboratory classes, verbal preparation of students for the exercise is verified. Passing the laboratory classes requires the completion of all exercises, individual completion of the reports indicated by the teacher and passing a test checking the knowledge of students acquired during the implementation of all exercises.

Programme content

Laboratory.
Basics of programming and communication of PLC controllers. Construction of measurement systems using PLC controllers and SCADA systems. The use of open source software as an alternative method of visualizing control processes

Course topics

Laboratory. The issues covered are related to:
- visualization of PLC parameters on the HMI panel
- management of the PLC controller through the HMI panel
- visualization and remote management of the PLC controller using the SCADA system
- using Java software as an alternative method of visualization of control processes
- unconventional use of HMI and SCADA
- communication of the PLC and LabVIEW controller using the Ethernet network.
- processing and archiving of measurement results using the LabVIEW software.

Teaching methods

Laboratory: multimedia presentations supplemented with examples given on the board, performing laboratory exercises in teams (at properly configured workstations, which include Siemens S7-1200 PLC controllers, Siemens KTP 700 Basic PN HMI panels, PCs with WinCC and LabVIEW software and cooperating with miniature simulators of real actuator systems) with the help and supervision of the teacher.

Bibliography

Basic:
1. A. Hulewicz, Z. Krawiecki, Sterownik PLC i panel operatorski w układzie automatyki inteligentnego budynku, , Poznan University of Technology Academic Journals, Electrical Engineering, No 92, Poznań 2017, s. 345-354.
2. T. Gilewski., Podstawy programowania sterowników SIMATIC S7 1200 w języku LAD, BTC, Warszawa 2017.
3. R. Sałat, K. Korpysz, P. Obstawski, Wstęp do programowania sterowników PLC, WKŁ, Warszawa 2010.
4. A. Król, J. Moczko-Król, S5/S7 Windows Programowanie i symulacja sterowników PLC firmy Siemens, Nakom, Poznań 2002.
5. J. Kasprzyk, Programowanie sterowników przemysłowych, WNT, Warszawa 2006

Additional:
1. Hulewicz A., Krawiecki Z., Parzych J., Przykłady niekonwencjonalnych zastosowań sterowników PLC,

Poznan University of Technology Academic Journals, Electrical Engineering, No 91, Poznań 2017, s. 81-92.
2. U. Tietze, Ch. Schenck, Układy półprzewodnikowe, WNT, Warszawa 2009.
3. J. Bogusz, Lokalne interfejsy szeregowe w systemach cyfrowych, Wyd. BTC, Warszawa 2004.

Breakdown of average student's workload

	Hours	ECTS
Total workload	80	3,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00