COURSE DESCRIPTION CARD - SYLLABUS

Course name
PLC controllers and SCADA systems in measurement and control [S1Eltech1>B-PLCwPiS]

Course

Field of study
Electrical Engineering

Year/Semester
3/6

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
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

The student starting this subject should know basic knowledge in the scope of electrotechnics, metrology and computer science and basic knowledge in the scope of electronics, including electronic analog and digital circuits. Should ability of the efficient self-education within the scope of PLC controllers programming and willingness to cooperate in a team.

Course objective

Providing students with basic knowledge of programming of the selected PLC controllers and knowledge of interdisciplinary achievements related to industrial applications of PLC controllers

Course-related learning outcomes

Knowledge:
1. Ability to describe importance and application possibilities of the modern measuring systems
2. Ability to explain the principles and techiques of measuring signal acquisition for industrial applications

Skills:

1. Ability to work independently and as a team in the design and construction companies as well as in the industrial centres
2. Ability to design the measuring systems creatively, using possibilities offered by new technologies

Social competences:
1. Ability to think and act enterprisingly in the area of measuring systems used in industry

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lectures: Knowledge acquired during the lecture is verified by a 45-minute colloquium carried out during the 8th lecture. The test consists of 6-8 questions (open), variously scored. Passing threshold: 50% of points. Final issues on the basis of which questions are developed will be made available to students in the Moodle system.
Laboratory: Skills acquired as part of the laboratory are verified during each class on the basis of programmed mockups using PLC and HMI and a final test in 15 laboratories consisting in the implementation of a given program task. Passing threshold: 50% of points.
Project: Skills acquired as part of the project are verified on the basis of the developed and made project of an exemplary control system using a PLC and SCADA system.

Programme content

Lectures:
1. Structure of the measuring systems using PLC controllers, HMI panels and SCADA systems. Programming languages and examples of measuring systems configurations with the use of a PLC controller.
Laboratory:
Construction and programming of control systems using PLC controllers and HMI panels.
Project:
Construction and programming of measuring systems using PLC controllers and SCADA system.

Course topics

Lectures:
1. Structure of the measuring systems using PLC controllers, HMI panels and SCADA systems.
2. Programming languages of PLC controllers: graphic and text.
3. Fundamentals of programming, operations on tha data, signal processing, controllers communications.
4. Examples of measuring systems configurations with the use of a PLC controller, HMI panel and SCADA system.
Laboratory:
1.Construction of control systems using PLC controllers and HMI panel.
2. Programming of control systems using a PLC and HMI panels.
Project:
1. Project and construction of measuring system using PLC controllers and SCADA system.
2. Programming of measuring system using a PLC and SCADA systems

Teaching methods

Lectures: Multimedia presentations expanded by examples shown on a board.
Laboratory: Multimedia presentations expanded by examples shown on a board and realization of experiments
Project:Multimedia presentations expanded by examples shown on a board and realization of project.

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	85	3,00
Classes requiring direct contact with the teacher	75	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,00