Programmable logic controllers - course description

General information

Course name	Programmable logic controllers
Course ID	06.5-WE-AutP-ProgLogContr-Er
Faculty	Faculty of Engineering and Technical Sciences
Field of study	Automatic Control and Robotics
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information

Semester	4
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	• dr inż. Małgorzata Mazurkiewicz

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Credit with grade
Laboratory	30	2	-	-	Credit with grade

Aim of the course

- Introduction to PLC class controllers.
- To develop skills in configuration and programming of PLC controllers.
- Developing skills in using the TIA Portal environment in solving simple engineering tasks.

Prerequisites

Architecture of computer systems.

Scope

- Introduction to PLC controllers. Construction of PLC controller. PLC work cycle.
- PLC programming according to IEC standard.
- Ladder Diagram language. Basic elements. Rules for creating a program in LAD. The most important language constructions.
- New generation PLC controllers: S7 -1200 series. Network configuration, system structure. Programming with new engineering tools.
- Process visualisation. Human Machine Interface in control system.

Teaching methods

Lecture, laboratory exercises.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to design a simple control system based on a PLC class controller.		• a test • an evaluation test	• Lecture
Student is able to list and characterize the basic concepts of PLC class devices.		• a test • an evaluation test	• Lecture
The student has elementary knowledge of PLC.		• a quiz • an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
The student knows the construction of PLC controllers and is able to give examples of their use.		• a quiz • an ongoing monitoring during classes	• Laboratory

Assignment conditions

- Lecture – the passing condition is to obtain a positive mark from the test.
- Laboratory – the passing condition is to obtain positive marks from laboratory exercises to be planned during the semester.

Recommended reading

1. L. A. Bryan, E. A. Bryan: Programmable controllers. Theory and Implementation, Amber Technical Pub, 2003.

2. K. Collins: PLC Programming for Industrial Automation, Exposure Publishing, 2006.
3. H. Berger: Automating with SIMATIC S7-1200: Configuring, Programming and Testing with STEP 7 Basic, 2013.

Further reading

Notes

Modified by dr hab. inż. Wojciech Paszke, prof. UZ (last modification: 12-07-2021 07:56)