Software for measurement and control equipment - course description

General information

Course name	Software for measurement and control equipment
Course ID	11.3-WE-INFD-SforMandCE-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Computer Science
Education profile	academic
Level of studies	Second-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information

Semester	3
ECTS credits to win	4
Course type	obligatory
Teaching language	english
Author of syllabus	• dr inż. Leszek Furmankiewicz

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
Laboratory	30	2	-	-	Credit with grade

Aim of the course

Forming the design skills of software for local and distributed measurement systems and measurement and control systems.

Prerequisites

Visualization systems.

Scope

Programmable Automatic Controllers (PAC). Creating software and visualization for PAC of B&R company.

Software for Data Acquisition Systems using LabView. Creating software for measurement and control system based on NI USB -6008 acquisition system.

Standard Commands for Programmable Instruments (SCPI). Creating software for IEEE-488.2 controller for cooperation with HP34401 multimeter and Keysight 33210A generator.

Internet technology in measuring systems. Programming the laboratory measuring instruments using the LXI interface.

Visualization of industrial measuring transducers networks. Designing software for a Modbus master using the LabWindows / CVI environment.

Slave node of Modbus network. Software design for the Modbus slave implemented on the basis of the Arduino platform.

Teaching methods

Laboratory exercises.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Can design software for the microcontroller performing the Modbus slave functions.		• an observation and evaluation of the student's practical skills • carrying out laboratory reports	• Laboratory
Can design software for measurement-control systems based on PLC and PAC controllers.		• an observation and evaluation of the student's practical skills • carrying out laboratory reports	• Laboratory
Can design communication software for measurement systems based on fundamental communication and network interfaces.		• an observation and evaluation of the student's practical skills • carrying out laboratory reports	• Laboratory

Assignment conditions

Laboratory – the passing condition is to obtain positive marks from all laboratory exercises to be planned during the semester.

Recommended reading

1. Caristi A., J.: *IEEE-488 General Purpose Instrumentation Bus Manual,* Academic Press, INC., San Diego, California, 1992
2. Johnson G.W, Jennings R.: *LabVIEW Graphical Programming.* McGraw-Hill Professional, 2006
3. Khalid S.F.: *LabWindows/CVI Programming for Beginners.* Prentice Hall PTR, 2000.
4. Yik Y.: *LabView Graphical Programming CookBook.* Packt Publishing, 2016.
5. Rinaldi John.S., Lydon Williman P.: The Everyman's Guide to Modbus. CreateSpace Independent Publishing Platform, 2015.

Further reading

1. Khalid S.F.: *Advanced Topics in Labwindows/CVI.* Prentice Hall PTR, 2001.

2. Collins K.: *PLC Programming for Industrial Automation.* Kindle edition, 2016.

Notes

Modified by dr inż. Leszek Furmankiewicz (last modification: 15-07-2021 08:59)