COURSE DESCRIPTION CARD - SYLLABUS

Course name
Networks and visualization in automatization [S2Mech1>SiWwA]

Course

Field of study
Mechatronics

Year/Semester
1/2

Area of study (specialization)
Mechatronic System Design

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

The student learned the basics of electronics, basics of automation, elements of mechatronics, drives and sensors, automation and supervision of machines

Course objective

To learn the technique of PLC work in industrial networks, the basics of design and application of visualization interfaces on HMI panels and computer systems.

Course-related learning outcomes

Knowledge:
The student has expanded knowledge about the construction of PLC controllers and controllers based on PCs and knowledge of the rules for connecting these controllers. He learns how to create visualizations and supervise an industrial process.

Skills:
The student is able to visualize for a given technological process. Can connect process controller with visualization. He knows the basic ways of cooperation of industrial devices in the network, can configure the selected connection.

Social competences:
The student understands the need for lifelong learning; can inspire and organize the learning process of others. Is aware of the role of automation in modern economy and its importance for society and the environment. Is able to set priorities for the implementation of a specific task.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: Credit based on a written exam consisting of 3-4 general questions in the subject (<50% - ndst, 50-60%: dst 60-70% -dst +, 70-80: db, 80-90: db +, > 90% - very good)
Laboratory: Assessment based on oral or written answers from the content of the exercise and the assessment of passing reports on each exercise. Passing from the laboratory is done after meeting both criteria.

Programme content

Fundamentals and standards of data exchange between PLCs and external devices - hardware and software layer. Overview of industrial networks (e.g. CAN, ProfiBus, Modbus) and the principles of connecting and configuring network components. Serial communication standards (RS 232 and 485, USB, Ethernet and Internet) and elements of wireless communication (e.g. GPRS, modems and radiomodems, Bluetooth). Introduction to visualization techniques, creating and managing user windows, creating and managing variables. User interface objects. Work with alarms and events. Current and historical trends. Networking.

Teaching methods

Lecture: multimedia presentation illustrated with examples
Laboratory: Topics implemented in groups in teaching positions,

Bibliography

Basic
1. Sterowniki PLC w praktyce inżynierskiej, Kwaśniewski J., BTC, Legionowo, 2008
2. Wonderware Intouch- Podręcznik użytkownika, Praca zbiorowa, Invensys systems
3. Pierwsze kroki z Simatic S7-1200, Wydawnictwo Siemens, 2014
Additional
1. Materiały dodatkowe, udostępniane przez producentów (Siemens, Omron)

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
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)	20	1,00