COURSE DESCRIPTION CARD - SYLLABUS

Course name
Programming of industrial controllers [N1Mech2>PSP2]

Course

Field of study
Mechatronics

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
8

Laboratory classes
8

Other
0

Tutorials
0

Projects/seminars
8

Number of credit points

3,00

Coordinators

Lecturers

Prerequisites

The student learned the basics of electronics, the basics of automation, elements of mechatronics, drives and sensors, automation and supervision of machines. Learned the basics of programming PLC controllers, implementation of basic logical functions. Initially learned about sensors and drives.

Course objective

Learning about the structure, operation, design and programming of industrial device controllers

Course-related learning outcomes

Knowledge:
Extended knowledge of the structure of PLC controllers and knowledge of the principles of connecting I/O elements to these controllers. Knowledge of languages and methods of programming and configuring PLC controllers and drives of production devices and systems.

Skills:
The student understands the need for lifelong learning; is able to inspire and organize the learning process of others. Is aware of the role of automation in the modern economy and its significance for society and the environment. Is able to define priorities for the implementation of a specific task.

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

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Passing based on a written exam consisting of 5-6 general questions from the subject (< 50% - ndst, 50-60%: dst 60-70%-dst+, 70-80: db, 80-90: db+, > 90% - bdb)
Laboratory: Passing based on an oral or written answer from the content related to the exercise performed and an assessment of the reports from each exercise. Passing the laboratory takes place after meeting both criteria
Project: Assessment based on assessment of the implementation of the project topic tasks assigned to a group of students and assessment of the involvement of individual persons in the implementation of part of the project..

Programme content

Discussion of selected issues in programming industrial controllers on various hardware platforms, drive control, and an introduction to machine safety functions.

Course topics

Control of drives using PLC controllers. Drives with their setup environments and drives with their own motion controllers. Configuration of drives on selected hardware platforms. Examples of programs for selected hardware platforms. Basics of HMI and SCADA visualization. Safety functions, selection of components, hardware platforms for safety functions. Redundancy.

Teaching methods

Lecture: multimedia presentation illustrated with examples
Laboratory: Topics implemented in groups at teaching stations
Project: projects carried out in groups of 2-3 students

Bibliography

Basic:
1. Kwaśniewski J., Sterowniki PLC w praktyce inżynierskiej, Wydawnictwo BTC, Legionowo 2008.
2. Flaga S., Programowanie sterowników PLC w języku drabinkowym, Wydawnictwo BTC, Legionowo 2010.
3. Pierwsze kroki z Simatic S7-1200, Wydawnictwo Siemens
4. J. Hawrylak, Języki programowania sterowników PLC: LAD, FBD, SCL, STL. Ćwiczenia dla początkujących, Wydawnictwo Helion
5. K. Korpysz, P. Obstawski, R. Sałat, Wstęp do programowania sterowników PLC, Wydawnictwa Komunikacji i Łączności WKŁ

Additional:
1. Terminal HMI serii NQ - Instrukcja obsługi, Omron
2. Materiały dodatkowe, udostępniane przez producentów sprzętu

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	24	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	51	2,00