POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Programming of PLC controllers

Course

Field of study	Year/Semester
Construction and operation of means of transport	3/5
Area of study (specialization)	Profile of study
Industrial Mechatronics	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	30	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Ph.D Eng. Jan Górecki

email: jan.gorecki@put.poznan.pl

Tel. 61-665 2053

Faculty of Mechanical Egineering

Responsible for the course/lecturer:

Prerequisites

KNOWLEDGE: Basic knowledge of electronics, automation and information technology gained during the first cycle studies

SKILLS: Operation of PC computers; use of the English language sufficient to understand technical texts; obtaining information from literature, the Internet, databases and other sources; can search in catalogs and on the websites of manufacturers of ready-made machine components to be used in their own projects.

SOCIAL COMPETENCES: Understands the need and knows the possibilities of continuous training

Is aware of the importance and understands the non-technical aspects and effects of a mechanical engineer's activity and its impact on the environment and responsibility for decisions

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Is aware of the importance of professional behavior, adherence to the principles of professional ethics and respect for cultural diversity

Is aware of responsibility for their own work and is ready to comply with the rules of teamwork and responsibility for jointly performed tasks.

Course objective

During the course, the student becomes familiar with programming techniques used in the PLC industry in ladder language (LAD). Will acquire the ability to develop a simple program that can be used to control simple industrial devices

Course-related learning outcomes

Knowledge

Has an elementary knowledge of automation systems, control algorithms, automatic machines and programming of industrial machines

Has ordered, theoretically founded general knowledge in the field of technology, transport systems and various means of transport

Has knowledge of ethical codes relating to transport engineering, is aware of the dangers related to environmental protection and understands the specificity of mission-critical systems

Skills

He can search in catalogs and on manufacturers' websites ready-made machine components to be used in his own projects.

He can write basic programs in LAD

Profi design the basic automation system of an industrial device using PLCs

Social competences

He is ready to critically assess his knowledge and received content

Is willing to think and act in an entrepreneurial manner

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

EXAM: Passed on the basis of an examination consisting of 10 single-choice general test questions (for a correct answer to each question - 1 point.

Grading scale:

- 0 ÷ 4 points -ndst.,

- 5 points - dst,

- 6 points - dst +,

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- 7 points - db,

- 8 points - db +,

- 9 ÷ 10 points - very good).

Laboratory: Credit based on the correct performance of exercises and a test conducted on the last laboratory exercises according to the instructions of the laboratory teacher. In order to pass the laboratories, all exercises must be passed and a positive grade from the test must be obtained.

Programme content

1. Construction of PLC controllers;

2. Logic gates and the way of writing them in ladder language;

3. functions of maintaining the signal value with the use of RS and SR gates;

4. Control with the use of signal edges;

5. Types of memory in the PLC and the possibility of saving processed information;

6. The use of counters in the program to control the machine;

7. Discrete data processing, with particular emphasis on the comparison of register values;

8. Analog signal discretization;

9. Formulating subroutines and interrupt routines

Teaching methods

1. During the lectures, a multimedia presentation is used to support the implemented problem method, during which a problem is presented that a group of students solves together with the support of the tutor and information provided during the lecture

2. Laboratories - case studies - a group of 2-3 students solves a given problem based on the knowledge and skills acquired during the lecture

Bibliography

Basic

1. Mikulczyński T., Automatyzacja procesów produkcyjnych, Wyd. Naukowo Techniczne, 2006

2. Kasprzyk J., Programowanie sterowników przemysłowych, Wyd. Naukowo Techniczne, 2006

Additional

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Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	25	1,0

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[1] delete or add other activities as appropriate