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

Automation

Course

Field of study	Year/Semester
Mechatronics	3/5
Area of study (specialization)	Profile of study
-	general academic
Level of study	Course offered in
First-cycle studies	English
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
10	10	0
Tutorials	Projects/seminars	
0	0	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Prof. DSc. PhD. Eng. Andrzej Milecki

Responsible for the course/lecturer:

PhD. Eng. Dariusz Sędziak

Prerequisites

Basics of electronics, automatics, basics of metrology, basics of mechatronics, drives and sensors, definition and implementation of digital functions, description of linear automation systems. Understands the need to learn.

Course objective

Acquainting with the basics of automation in industry and with elements, systems and automation systems

Course-related learning outcomes

Knowledge

Knowledge of signals and methods of their transmission in automation

Knowledge of automation levels used in industrial automation

He/She knows the general structure, operation and parameters of binary sensors used in automation

He/She knows the general structure, operation and parameters of measuring elements used in automation

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Has/She knowledge of drive units used in automation

Has/She knowledge of building industrial controllers and connecting automation elements to them

He/She knows the construction and operation of industrial automation systems

Skills

He/She can select sensors, elements and measuring systems for the automated device

He/She knows the basics of the selection of actuators and drives for machines used in automation

Is able to design control systems for a production device or machine using a PLC and to develop a control algorithm

He/She can obtain information from the Internet and technical literature on automation

Social competences

Understands the need for lifelong learning; can inspire and organize the learning process of other people

He/She is aware of the role of automation in the industial devices and its importance for society and the environment

Can 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:

EXAM: Passed on the basis of an examination consisting of 5 general questions (for a correct answer to each question - 1 point. Grading scale: less than 2.6 points - 2, 2.6 ÷ 3.0 - 3.0, 3.1 ÷ 3.5 points - 3.5, 3.6 ÷ 4.0 points - 4.0, 4.1 ÷ 4.5 points - 4.5, 4.6 ÷ 5.0 points - 5.0 very good)

Laboratory: Credit based on the correct implementation of exercises and reports on each laboratory exercise according to the instructions of the laboratory teacher. Before the exercises, short entrance tests, and after the exercises, a written final test. In order to pass the laboratories, all exercises must be passed (positive grade from the answers and the report).

Classes: Assessment based on the final test.

Programme content

1. Structure of an automated system. Information signals and coding in automation.

2. Signal transmission in industrial automation systems. Power supply in automation systems.

3. Sensors for detecting objects and machine elements. Two-state sensors.

4. Analog sensors and measurements of analog values in automation. Measurements of speed, acceleration, force, temperature etc.

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5. Motors and drives used in automation. Relays and contactors. Stripe and RFID systems.

6. Basics of vision systems. PLC controllers - structure, connection and operation.

7. Examples of automation systems in industry.

Teaching methods

Lectures and presentations

Bibliography

Basic

Industrial Automation: Hands On by Frank Lamb, 2013.

Introduction to Industrial Automation, Stamatios Manesis, George Nikolakopoulos, 2018.

Additional

Automation Made Easy: Everything You Wanted to Know about Automation--and Need to Ask, Peter G. Martin , Gregory Hale, 2009

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	40	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	35	1,5

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[1] delete or add other activities as appropriate