COURSE DESCRIPTION CARD - SYLLABUS

Course name
Industrial automatics [S1MwT1>B-AP]

Course

Field of study
Mathematics in Technology

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
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

5,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of mathematics, physics and electrical metrology. Assembly of simple measuring circuit on the ground of circuit diagrams. Ability to evaluation of measurement results. Ability to effective cooperation in team.

Course objective

Knowledge in scope of mathematical describe and structure of control systems and also in scope of programming and using of programmable logic controllers

Course-related learning outcomes

Knowledge:
1. Basic knowledge in scope of automatics and control.
2. Basic knowledge in scope of programmable logic controllers, sensors and interfaces in industrial automatics.

Skills:
1. Can design of simply algorithm of control and also know of programming languages and debugging

tools in scope of industrial automatics.
2. During the tests of control system can acquire of specialistics knowledge from catalogs.

Social competences:
1. Can ask a precisely questions with the purpose of understanding of problems.
2. Can correctly solve a problems connection with his profession.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: Exam in form of a test in writing (passing over 50%).
Tutorials: Currently estimating of knowledge and skills. Two tests in writing (passing over 50%).
Laboratory classes: Currently estimating of knowledge and skills. Evaluation of prepared reports from laboratories

Programme content

Update: 2020.
Lectures: Basic diagram of control system with examples. Regulators with direct action. Transformation of block diagrams of control systems. Linear and continuous control systems: mathematics description, application of Lagrange equation to obtain mathematic description of elements of control systems, static and dynamic properties of elements of control systems, stability of control system. Linear and discrete control system: mathematics description, bilinear transform, stability of discrete control system. Nonlinear control systems. The systems of industrial automatics with programmable logic controllers. Principle of operation and programming languages of PLC controllers. The devices of industrial automatics: stepper motors, DC-motors, servo-mechanisms. Sensors of physicals parameters and communications interfaces in scope of industrial automatics. Imaging of control systems. The systems of digital automatics.
Tutorials: Calculations in the scope of description and testing the properties of automatic control systems.
Laboratory classes: Programming of PLC controlers in LAD language.

Teaching methods

Lectures: Multimedia presentations expanded by examples shown on a board. Activity of students is taken into consideration in final students evaluation. Theoretical questions are presented in the exact reference to the practice.
Laboratory classes: Detailed reviewing of particular exercises reports. Realization of laboratory tasks in teams. Specific computational experiments.
Methods of education are orientated to students to motivate them to participate actively in education process by discussion and reports..

Bibliography

Basic
1. Kaczorek T., Dzieliński A., Dąbrowski W., Łopatka R., Podstawy teorii sterowania, WNT Warszawa 2008.
2. Urbaniak A., Podstawy automatyki, Wyd. Politechniki Poznańskiej, Poznań 2008.
3. Chmiel K. Teoria układów logicznych. Wyd. Politechniki Poznańskiej, Poznań 1995.
3. Kwaśniewski J., Sterowniki PLC w praktyce inżynierskiej, Wyd. BTC, Warszawa 2008.
Additional
1. Mielczarek W., Szeregowe interfejsy cyfrowe, Wyd. Helion, Gliwice 1993.
2. Nawrocki W., Komputerowe systemy pomiarowe, WKiŁ, Warszawa 2006.
3. Zieliński T., Cyfrowe przetwarzanie sygnałów. WKiŁ, Warszawa 2005.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	70	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00