



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Elective subject B: Electrical and electronic systems in industry and vehicles

Course

Field of study

Year/Semester

Electrical Engineering

3/6

Area of study (specialization)

Profile of study

Electromobility and electrical systems in vehicles and industry

general academic

Level of study

Course offered in

First-cycle studies

polish

Form of study

Requirements

full-time

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

30

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Wydział Automatyki, Robotyki i Elektrotechniki

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Prerequisites

Knowledge of Boolean algebra, minimization of logic functions, basics of microcontrollers and programming

Course objective

Synthesis of selected industrial control systems, development of algorithms and control programs for PLC controllers, their activation and testing.

Course-related learning outcomes

Knowledge

Architecture, instruction list, timers, counters, S7-1200 PLC interrupts, selected PLC programming languages



Skills

Is able to formulate a control algorithm for combinational systems and the SFC method, uses programming languages and appropriate IT tools used in electrical engineering

Social competences

Is aware of the importance of own work and compliance with professional ethics, is ready to comply with the principles of team work and take responsibility for jointly performed tasks

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - 90 minutes final test

Laboratory - development of the control algorithm; writing, launching and presenting the control program of an example control system

Programme content

PLC programmable controllers: their architecture, interrupts, timers, fast counters, PTO and PWM generators, instruction list; PLC programming languages; synthesis of control systems in the traditional and SFC approach, control algorithms of sample industrial systems, their SFC diagrams and control programs.

Teaching methods

Lecture: multimedia presentation illustrated with examples given on a blackboard

Laboratory exercises: multimedia presentation, presentation illustrated with examples given on a blackboard, and performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

Mikulczyński T., Samsonowicz Z., Automatykacja dyskretnych procesów produkcyjnych, WNT, Warszawa 1997.

Seta Z. , Wprowadzenie do zagadnień sterowania, Wydawnictwo Mikom, Warszawa 2002.

Kamiński K., Programowanie w Step 7 Microwin, GRYF, Warszawa 2006.

Dokumentacja sterownika S7-1200 firmy Siemens.

Additional

Bubnicki Z.: , Teoria i algorytmy sterowania, Wydawnictwo Naukowe PWN, Warszawa 2002



Breakdown of average student's workload

	Hours	ECTS
Total workload	88	3,0
Classes requiring direct contact with the teacher	68	3,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	20	2

¹ delete or add other activities as appropriate