# COURSE DESCRIPTION CARD - SYLLABUS

Course name

Elective subject B: Electrical and electronic systems in industry

## Course

| | |
|---|---|
| Field of study | Year/Semester |
| Electrical Engineering | 4/8 |
| 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 |
| part-time | elective |

## Number of hours

| Lecture | Laboratory classes | Other (e.g. online) |
|---|---|---|
| 20 | 20 | |
| Tutorials | Projects/seminars | |

## Number of credit points

3

## Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

## 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

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

## Breakdown of average student's workload

| | Hours | ECTS |
|---|---|---|
| Total workload | 90 | 3,0 |
| Classes requiring direct contact with the teacher | 35 | 1,0 |
| Student's own work (literature studies, preparation for laboratory classes, preparation for the final test) [1] | 55 | 2,0 |

[1] delete or add other activities as appropriate