STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Control Engineering and computing science in industry and	**1010322331010324814**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**general academic**	**2 / 3**
Elective path/specialty: **Electrical and Computer Systems in**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time): **full-time**	

No. of hours	No. of credits
Lecture: **15** Classes: **-** Laboratory: **-** Project/seminars: **-**	**2**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
other	**university-wide**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**2 100%**
Technical sciences	**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of automation, control theory, PLCs and microcontrollers.
2	**Skills**	The ability to understand and interpret the messages conveyed and effective self.
3	**Social competencies**	Awareness of the need to broaden their competence.

Assumptions and objectives of the course:

Knowledge of PLC cooperation with microcontrollers.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. PLC cooperation with microcontrollers - [K_W08++]
2. selected interrupt of PLC and microcontroller - [K_W08++]

Skills:

1. use the acquired knowledge to work PLCs and microcontrollers - [K_U15++]
2. capacity for independent thinking and creative action - [K_U15++]

Social competencies:

Assessment methods of study outcomes

Lecture:
- final test.

Course description

PLCs - serial port, free port mode transmission, the selected interrupt PLC and microcontroller,
comparison of the control program written in LAD for the PLC controller and in the C language for the microcontroller,
selection of elements in the compressed air system,
selection of the digital PID controller settings.

Basic bibliography:

1. Kamiński K.: Programowanie w Step 7 Microwin, GRYF, Warszawa 2006.
2. Dokumentacja sterownika S7-1200 firmy Siemens.

Additional bibliography:

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

Result of average student's workload

Activity	Time (working hours)
1. participation in lectures	15
2. consultations for lectures	10
3. preparation for the completion of lectures	15
4. credit lecture	2

Student's workload

Source of workload	hours	ECTS
Total workload	42	2
Contact hours	25	1
Practical activities	0	0