STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Control Engineering and computing science in industry and**		Code **1010324391010324814**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **5 / 9**
Elective path/specialty **Electrical and Computer Systems in**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	
No. of hours Lecture: **9** Classes: **-** Laboratory: **9** Project/seminars: **-**		No. of credits **2**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **2 100%** **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, 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:

Synthesis of selected industrial control systems, development of control programs for PLCs, their start-up and testing.

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

Knowledge:

1. architecture, instruction set, timers, counters, interrupts PLC Siemens S7-1200 - [K_W07+]
2. selected PLC programming languages - [K_W07+]

Skills:

1. use the knowledge gained to create algoritms control and write application programs - [K_U04+]
2. selected PLC programming languages - [K_U04+]

Social competencies:

Assessment methods of study outcomes

Lecture:
- Final test.

Laboratory:
- The development of the control algorithm, the design and the control sample run control system.

Course description

PLCs, their architecture, interrupts, timers, PLC programming languages??, algorithms, sample control industrial systems, the SFC diagrams and control programs.

Basic bibliography:

1. Mikulczyński T., Samsonowicz Z.: "Automatyzacja dyskretnych procesów produkcyjnych", WNT, Warszawa 1997.
2. Seta Z.: "Wprowadzenie do zagadnień sterowania", Wydawnictwo Mikom, Warszawa 2002.
3. Kamiński K.: "Programowanie w Step 7 Microwin", GRYF, Warszawa 2006.
4. 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	9
2. consultations for lectures	3
3. credit lecture	2
4. participation in laboratory classes	9
5. preparation of projects	4
6. consultation for laboratory classes	5
7. preparation for the completion of lectures	6
8. preparation laboratory	6

Student’s workload

Source of workload	hours	ECTS
Total workload	44	2
Contact hours	28	1
Practical activities	24	1