STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Automated Production Systems		**1011101261010536783**
Field of study	Profile of study (general academic, practical)	Year /Semester
Logistics - Full-time studies - First-cycle studies	**(brak)**	**3 / 6**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**elective**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **15** Classes: **-** Laboratory: **15** Project/seminars: **-**		**2**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
(brak)	**(brak)**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences **Technical sciences**		**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 linear algebra, Boolean algebra, information technology, and fundamentals of programming
2	**Skills**	Acquiring information from technical literature and documentation (also in English), team work, using computer tools
3	**Social competencies**	Risk awareness when working with mechanical and electrical equipment, sense of responsibility for other people safety

Assumptions and objectives of the course:

Demonstrating knowledge of theoretical and practical basics of automation and robotics.

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

Knowledge:

1. The student has a basic knowledge related to industrial automation and robotics - [K1A_W06]
2. She/he has a basic knowledge of the structure of industrial manipulators and control systems - [K1A_W07]

Skills:

1. Student is able to independently develop a simple project in the area of the subject - [K1A_U05]
2. She/he can use known methods to formulate and solve given problem within the area of the subject - [K1A_U09]
3. She/he is able to formulate and solve engineering tasks perceive their non-technical and organizational aspects - [K1A_U10]

Social competencies:

1. The student is aware of the need for lifelong learning and to inspire and organize the learning process of other - [K1A_K01]
2. She/he is willing to cooperate and work in teams to solve given tasks - [K1A_K03]

Assessment methods of study outcomes

Formative assessment:

a) for the lecture: on the basis of answers to questions about the topics covered in previous lectures,

b) for the laboratory: based on an assessment of the progress of the laboratory tasks.

Recapitulative assessment:

a) for the lecture: on the basis of written work on the issues discussed during the lectures,

b) for the laboratory: on the basis of the assessment of performed laboratory tasks and their reports.

Course description

The concept of automatics, automatic control system, examples of control systems, components and classification of control systems, tools for supervising of technological processes (SCADA systems). Controllers: the task of controllers, types and properties of the regulators, two- and three-position controllers, continuous PID controllers, tuning methods. Fundamental concepts of robotics, types and general design of robots, tasks of industrial robots, kinematic structures, coordinate systems, representation of the localization, manipulator kinematics, systems and programming languages based on KUKA and Stäubli manipulators. Structure and basics of PLC operation, cycles of the PLC, inputs and outputs, programming languages, elements of programming in the ladder language. Construction and principle of operation of selected sensors and measuring devices used in automation and robotics.

Basic bibliography:

1. Wprowadzenie do robotyki: mechanika i sterowanie, J.J. Craig, WNT 1995

2. Elementy, urządzenia i układy automatyki, J. Kostro, WSiP 1998

3. Modelowanie komputerowe i obliczenia współczesnych układów automatyzacji, R. Tadeusiewicz, G.G. Piwniak, W.W. Tkaczow, W.G.Szaruda, K. Oprzędkiewicz, AGH 2004

Additional bibliography:

1. Springer Handbook of Automation, S.Y. Nof (Edytor), Springer 2009

2. Badanie i projektowanie układów regulacji, Z. Szopliński, WNT 1975

3. Modelowanie i sterowanie robotów, K. Kozłowski, P. Dutkiewicz, W. Wróblewski, PWN 2003

Result of average student's workload

Activity	Time (working hours)
1. Lecture	15
2. Laboratory	15
3. Consultation for laboratory classes	3
4. Preparation for laboratory exercises and reports	10
5. Preparing to pass the lecture	7

Student’s workload

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	33	1
Practical activities	15	1