POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Automation and Industrial Robotics

Course

Field of study	Year/Semester
Engineering Management	3/6
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	english
Form of study	Requirements
part-time	elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
8	10	
Tutorials	Projects/seminars	

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr inż. Bartłomiej Krysiak

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Wydział Automatyki, Robotyki i Elektrotechniki

ul. Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

The student starting this subject should have basic knowledge of linear algebra, Boolean algebra, information technology and the basics of programming. He should also have the skills to obtain information from literature and technical documentation, work in a team and use IT tools, be aware of the risks when working with mechanical and electrical devices and have a sense of responsibility for the safety of other people.

Course objective

Presentation of theoretical and practical knowledge in the field of production automation and robotics.

Course-related learning outcomes

Knowledge

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1. The student knows the basic methods, techniques and tools used in solving simple engineering tasks in the field of construction and operation of automation and robotics elements - [P6S_WG_16].

2. The student is familiar with typical industrial technologies and knows the technologies of construction and operation of automation and robotics components - [P6S_WG_17].

Skills

1. The student is able to make a preliminary analysis of technological processes of automatic machines and robots used in production - [P6S_UW_13]

2. The student is able to identify design tasks and solve simple design tasks in the use of automation and robotics elements - [P6S_UW_14].

3. The student is able to apply typical methods of solving simple problems in the field of using elements of automation and robotics - [P6S_UW_15].

Social competences

1. The student is aware of the importance and understands the non-technical aspects and effects of engineering activities, including their impact on the environment, and the related responsibility for decisions taken - [P6S_KR_01]

2. The student is aware of initiating activities related to the formulation and transmission of information and cooperation in society.

3. The student is aware of the need to cooperate and work in a group in order to solve the problems posed.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified by the 45-minute final test consists of 25-30 questions. Passing threshold 50% of points.

Skills acquired as part of the laboratory classes are verified on the basis of completed laboratory tasks and prepared protocols.

Programme content

The concept of automation, automatic control system, example systems. Controllers: tasks of controllers, types and properties of controllers, continuous PID controllers. Basic concepts of robotics, types and general construction of robots, tasks of industrial robots, coordinate systems, location representation, manipulator kinematics, manipulator programming and languages on the example of KUKA. Construction and operation principle of programmable logic controllers (PLC), the sweep of the controller, input and output of controllers, programming languages, basics of programming in ladder language. Construction and operation of selected sensors and measuring devices used in automation and robotics.

Teaching methods

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Lecture - informative and conversational lecture

Laboratory - laboratory method

Bibliography

Basic

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

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

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

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	2,0
Classes requiring direct contact with the teacher	18	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	22	1,0

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[1] delete or add other activities as appropriate