



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Industrial control engineering and robotics

Course

Field of study

Engineering management

Area of study (specialization)

Year/Semester

3/6

Profile of study

Level of study

First-cycle studies

Form of study

part-time

Course offered in

english

Requirements

elective

Number of hours

Lecture

8

Tutorials

Laboratory classes

10

Projects/seminars

Other (e.g. online)

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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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

1. The student knows the basic issues of design and principles of operation of automation and control systems. - [P6S_WG_01]
2. Knows the basic issues of mechanics, construction and operation of industrial manipulators. - [P6S_WG_02]

Skills

1. The Student is able to apply appropriate experimental and measuring techniques as well as software tools to solve the problem within the subject. - [P6S_UW_03]
2. Can formulate and solve engineering tasks to see their systemic and non-technical aspects as well as socio-technical, organizational and economic aspects. - [P6S_UW_04]
3. Is able to identify changes in requirements, standards, regulations, technical progress and based on them determine the needs of supplementing knowledge. - [P6S_UU_01]

Social competences

1. The student is aware of the initiation of activities related to the formulation and transfer of information and cooperation in society. - [P6S_KO_02]
2. Is aware of the need to cooperate and work in a group to solve the problems posed. - [P6S_KR_02]

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

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	50	2,0
Classes requiring direct contact with the teacher	22	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	28	1,0

¹ delete or add other activities as appropriate