COURSE DESCRIPTION CARD - SYLLABUS

Course name

Industrial robot applications

Course

Field of study

Management and production engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

polish

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

street. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

The student should have knowledge of physics, mechanics and techniques at the secondary technical

level. He should have the ability to solve elementary problems in the field of building control algorithms (programming rules) and designing technological processes based on his knowledge and the ability to obtain information from indicated sources.

Course objective

Providing students with theoretical and practical issues related to the automation and robotization of production processes including basic manufacturing techniques in the scope specified by the program content appropriate for the field of study.

Course-related learning outcomes

Knowledge

The student is able to:

Identify, describe and explain the principle of operation of the basic structural units of the manipulator and the control system of an industrial robot.

Characterize the basic areas of application as well as the role and tasks of automation and robotization in typical technological processes.

Select appropriate programming instructions for a specific task in the field of programming industrial robots.

Skills

The student can:

Develop algorithms and control programs for cooperating industrial robots, taking into account the initial and final conditions, and carry out tests of the control program.

Identify a technical problem, determine its degree of complexity, and then propose a solution that takes into account the final goal (effect).

Social competences

The student is able to:

Actively engage in solving the problems posed, independently develop and expand their competences, and cooperate in a team.

Properly define the priorities for the implementation of the task set by yourself or others.

Be entrepreneurial and creative (innovative).

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the course is verified on the attachment. It consists of 5 open-ended questions and one computational task with different scores. Passing threshold: 50%. The knowledge acquired during laboratory classes is verified on the basis of an oral or written answer regarding the content of each laboratory exercise performed, a report on each laboratory exercise according to the

guidelines set out in the guide to exercises and indications of the laboratory teacher. In order to pass the laboratories, all exercises must be passed (positive grade from answers and reports).

Programme content

Lecture

Mechanization, automation and robotization of production processes; Application areas and robot classification; Construction of industrial robots and manipulators; Subsystems and systems of a flexible manufacturing system; Technical and technological equipment of robotic stations (grippers, technological heads, cooperating devices); Examples of the application of industrial robots in production processes; The effects and effects of robotization; Safety issues at robotic positions; Trends in the development of robots and robotization of production processes;

Lab

Practical exercises in the field of principles and methods of programming educational and industrial robots.

Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board.

Laboratory exercises: performing experiments, solving problems, discussion, team work, programming.

Bibliography

Basic

1. Kost G., Łebkowski P., Węsierski Ł., Automatyzacja i robotyzacja procesów produkcyjnych, PWE, 2014
2. Żurek J., Podstawy Robotyzacji - Laboratorium., WPP, Poznań, 2006
3. Zdanowicz R. Robotyzacja dyskretnych procesów produkcyjnych, WPŚ, Gliwice, 2011
4. Zdanowicz R, Robotyzacja procesów technologicznych, WPŚ, Gliwice, 2001
5. Podręczniki programowania robotów, IRp-6, Fanuc, Panasoni

Additional

1. Honczarenko J., Roboty przemysłowe. Budowa i Zastosowanie, WNT, Warszawa, 2010
2. Wrotny T., Robotyka i elastycznie zautomatyzowana produkcja, WNT, Warszawa, 1991
3. Marciniak M., Elementy automatyzacji we współczesnych procesach wytwarzania, WPW, Warszawa, 2007

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	30	1,0

[1] delete or add other activities as appropriate