COURSE DESCRIPTION CARD - SYLLABUS

Course name

Industrial robots

Course

Field of study

Mechanical Engineering

Area of study (specialization)

Production Informatics and Robotics

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

-

Projects/seminars

15

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Academic Professor Olaf Ciszak

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Faculty of Mechanical Engineering

Piotrowo 3, 60-965 Poznan, room 638

Responsible for the course/lecturer:

Prerequisites

A student starting this subject should have basic basic knowledge of the programs and subjects provided

for students of the MiBM major in the second degree of studies. He should also have the ability to obtain information (library, electronic databases of scientific publications and patents, the Internet and others), process and analyze sources of knowledge leading to logical conclusions. Understand the need to learn, acquire new knowledge, organize the information obtained, verbalize own conclusions (self-presentation).

Course objective

Presentation of current trends in the construction and application areas of industrial robots.

Course-related learning outcomes

Knowledge

Student should knows:

- classification and construction of modern industrial robots

- current trends in the construction and application areas of industrial robots

- technical characteristics of industrial robots

- technical and technological equipment of industrial robots (e.g. sensors, vision systems, grippers, technological heads, etc.)

- technical and technological equipment (e.g. cooperating devices) and configuration of robotic cells

- rules and requirements for the safety of robotic stations.

Skills

Student should be able to:

- develop multi-variant solutions for a robotic production station, taking into account the initial and final conditions

- analyze the proposed variants of the robotic production station and choose the preferred solution

- develop algorithms and control programs for industrial robots working in the field of manipulation and conduct tests of the control program taking into account the initial and final conditions

- develop a design of a robotic cell for a specific technological task.

Social competences

Students should be able to cooperate in a group, express and justify their opinion, act in accordance with the rules of ethics.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: The knowledge acquired during the lecture is verified by a test (approx. 20 questions). Passing threshold: 50%.

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Laboratory: to pass on oral or written answers in the scope of each laboratory exercise, report on each laboratory exercise according to the guidelines set out in the guide for exercises and guidance for conducting laboratory exercises. To qualify for laboratories all exercises must be credited (positive feedback and report).

Project: The assessment includes project development, presentation and discussion in a group of students.

Programme content

Lecture: Development and forecasting on the robotics market; Robot application areas; Technical and organizational aspects of robotization; Profitability of robotization (components of robotic production costs, the impact of robotization on investment costs, economic efficiency calculation); Modern industrial robots and trends in their development; Technical and technological equipment of robotic stations (grippers, technological heads, cooperating devices); Methodology of designing robotic production systems; Work safety at robotic positions; Examples of the configuration of robotic stations.

Laboratory: Practical exercises in the field of the principles and methods of programming robots educational and industrial with cooperation with technological equipment. Work with the computer aided engineering system to design, programming and analysis of robotic cells (e.g. RobotStudio, RoboGuide) - practical exercises in developing a robotic cell design for a specific manipulation or technological task.

Project: development of a robotized cell project for a specific technological task. Preparation a solution of project task using a CA program supporting the design, programming, simulation and testing of virtual robotic cells.

Teaching methods

Lecture: multimedia presentation illustrated with videos, problematic discussion.

Laboratory: solving practical problems, searching for and using knowledge sources, teamwork, discussion.

Project: solving practical problems, searching for and using sources of knowledge, team work, discussion.

Bibliography

Basic

- Szkodny T., Podstawy robotyki, WPŚ, Gliwice, 2011

- Zdanowicz R. Podstawy robotyki, WPŚ, Gliwice, 2011

- Honczarenko J., Roboty przemysłowe. Budowa i Zastosowanie, WNT, Warszawa, 2010

- Zdanowicz R., Robotyzacja dyskretnych procesów produkcyjnych, WPŚ, Gliwice, 2011

- Wrotny T., Robotyka i elastycznie zautomatyzowana produkcja, WNT, Warszawa, 1991

- Żurek J., Podstawy Robotyzacji - Laboratorium., WPP, Poznań, 2006

Additional

- Olszewski M., Barczyk J., i inni, Manipulatory i roboty przemysłowe, WNT, 1992

- Zdanowicz R., Robotyzacja procesów technologicznych, WPŚ, Gliwice, 2001

- Gołda G., Kost G. (red.), Swider J. (red.), Zdanowicz R., Programowanie robotów online, WPŚ, Gliwice, 2011

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	3,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	70	2,0

[1] delete or add other activities as appropriate