

MODULE DESCRIPTION

Module code	Z-ZIP2-0117
Module name	Zastosowanie robotów
Module name in English	Robot Application
Valid from academic year	2016/2017

A. MODULE PLACEMENT IN THE SYLLABUS

Field of study	Management and Production Engineering
Level of education	2nd degree <i>(1st degree / 2nd degree)</i>
Studies profile	General <i>(general / practical)</i>
Form and method of conducting classes	Full-time <i>(full-time / part-time)</i>
Specialisation	All
Unit conducting the module	The Department of Automation and Robotics CLTM
Module co-ordinator	Stanisław Dziechciarz, PhD
Approved by:	

B. MODULE OVERVIEW

Type of subject/group of subjects	Major <i>(basic / major / specialist subject / conjoint / other HES)</i>
Module status	Compulsory <i>(compulsory / non-compulsory)</i>
Language of conducting classes	English
Module placement in the syllabus - semester	1st semester
Subject realisation in the academic year	Summer semester <i>(winter semester/ summer)</i>
Initial requirements	No requirements <i>(module codes / module names)</i>
Examination	No <i>(yes / no)</i>
Number of ECTS credit points	2

Method of conducting classes	Lecture	Classes	Laboratory	Project	Other
Per semester	15		10		

C. TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Module target	To acquaint students with the classification, construction and use of robots. Carry out practical activities using EDU-BOT education robot, KUKA and FANUC industrial robots.
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Effect symbol	Teaching results	Teaching methods (l/lab/p/other)	Reference to subject effects	Reference to effects of a field of study
W_01	Students have knowledge of modern production techniques with using of manipulators and industrial robots	l/lab	K_W10	T2A_W04
W_02	They have knowledge about methods of programming robot possibilities and can turn that information into management systems production	l/lab	K_W04	T2A_W03 S2A_W06
U_01	Students can use basic science knowledge to introduce modern solutions in production processes, including automation methods	l/lab	U_W03	T2A_U08 T2A_U15 T2A_U17
U_02	In frame of own work, they can expand their knowledge and skills in areas related to the development of production systems	l/lab	U_W07	T2A_U05 T2A_U09
K_01	They are aware of linking between engineering activities associated with production processes modernization, business sector and region development	l/lab	K_K02	T2A_K02 T2A_K04 T2A_U19

Teaching contents:

1. Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module
1	Introduction. Historical development of robotics. Development stimulating factors the of robotics. Basic definitions: manipulator, robot, robotics. Law (canons) robotics.	W_01 W_02 U_01 U_02 K_01
2	Basic systems and industrial robot parts. Block diagram of the robot. Block diagram of logic robot parts dependency. Robots classification, destination, type of drive.	W_01 W_02 U_01 U_02 K_01
3	Robots classification in view of: kinematic construction of the robots and kinematic structure. Robots base on serial kinematic structure: cartesian, cylindrical, SCARA, PUMA, spherical.	W_01 W_02 U_01 U_02 K_01
4	Generations of robots and their characteristics. Classification of control systems. Control systems tasks.	W_01 W_02 U_01, U_02 K_01
5	Classification of industrial robots programming methods.	W_01 W_02 U_01 U_02

		K_01
6	Areas of robot applications. Production lines, manufacturing cells, transport and warehouse management, and other such as: spot welding, arc welding, welding and laser cutting, assembly, manipulation and palletization	W_01 W_02 U_01 U_02 K_01
7	Presentation of films about the applications of industrial robots. Comments on examples shown in the movies	W_01 W_02 U_01 U_02 K_01
8	Test a written test	

2. Teaching contents as regards classes

Class number	Teaching contents	Reference to teaching results for a module

3. Teaching contents as regards laboratory classes

Laboratory class number	Teaching contents	Reference to teaching results for a module
1	Introduction to laboratory classes, health and safety regulations. Programming manipulator system X - Y.	W_01 W_02 U_01 U_02 K_01
2	Programming and service of EDUBOT educational robot.	W_01 W_02 U_01 U_02 K_01
3	KUKA Robot - familiarization with the robot and programming in user mode.	W_01 W_02 U_01 U_02 K_01
4	KUKA Robot - developing a program to move containers.	W_01 W_02 U_01 U_02 K_01
5	FANUC Robot - acquainting with the robot instructions and programming methods. Demonstration program.	W_01 W_02 U_01 U_02 K_01

4. The characteristics of project assignments

The methods of assessing teaching results

Effect symbol	Methods of assessing teaching results <i>(assessment method, including skills – reference to a particular project, laboratory assignments, etc.)</i>
W_01	Test in a test lab reports – discussion.
W_02	Test in a test lab reports – discussion.
U_01	Laboratory reports – discussion.
U_02	Laboratory reports – discussion.
K_01	Laboratory reports – discussion.

D. STUDENT'S INPUT

ECTS credit points		
	Type of student's activity	Student's workload
1	Participation in lectures	15
2	Participation in classes	
3	Participation in laboratories	10
4	Participation in tutorials (2-3 times per semester)	2
5	Participation in project classes	
6	Project tutorials	
7	Participation in an examination	
8		
9	Number of hours requiring a lecturer's assistance	27 <i>(sum)</i>
10	Number of ECTS credit points which are allocated for assisted work <i>(1 ECTS point=25-30 hours)</i>	1
11	Unassisted study of lecture subjects	10
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	
14	Unassisted preparation for laboratories	6
15	Preparing reports	8
15	Preparing for a final laboratory test	
17	Preparing a project or documentation	
18	Preparing for an examination	
19		
20	Number of hours of a student's unassisted work	28 <i>(sum)</i>
21	Number of ECTS credit points which a student receives for unassisted work <i>(1 ECTS point=25-30 hours)</i>	1
22	Total number of hours of a student's work	55
23	ECTS points per module <i>1 ECTS point=25-30 hours</i>	2
24	Work input connected with practical classes <i>Total number of hours connected with practical classes</i>	30
25	Number of ECTS credit points which a student receives for practical classes <i>(1 ECTS point=25-30 hours)</i>	1

E. LITERATURE

Literature list	<ol style="list-style-type: none"> 1. Craig J.J, <i>Introduction to Robotics</i>. 2. Gibilisco S., LaymanD.P., <i>Concise Encyclopedia of Robotics</i>. 3. http://www.eetimes.com/ 4. http://robotiq.com/ 5. https://www.used-robots.com/applications
Module website	