

## SYLLABUS

### Course description

Course code	Course	<b>ROBOTY PRZEMYSŁOWE</b>		
MB/O/I/ST/C1B.3		<b>INDUSTRIAL ROBOTS</b>		
Language of instruction	English			
Academic year	2023/2024			
<b>field of study:</b>	Mechanics and machine construction			
<b>field of specialisation:</b>	CAE			
Educational level	first-cycle studies			
Education profile	general academic			
Mode of study	full-time studies			
Semester(s)	6			
Affiliation with a group of classes	Specialization module			
Course status	Eligible			
Types of classes, instruction hours, ECTS credits	Types of classes	Number of instruction hours	Number of ECTS credits	
	Lecture	15 [h]	2 ECTS	
	Laboratory classes	15 [h]		
Linkage of the course	with the education profile	a subject related to conducted scientific research, is used by the student to acquire in-depth knowledge and the ability to conduct research		2 ECTS
	with qualifications	it is used to acquire engineering competences by the student		2 ECTS
	with science discipline	Mechanical engineering		2 ECTS
Form of teaching	Traditional – classes organized at the University /classes conducted using online learning methods and techniques			
Prerequisites	technical mechanics, strength of materials, construction and operation of machines			
Department	Mechanical Engineering			
Coordinator	PhD Karol Osowski			
The website of the basic organizational unit	<a href="http://www.wm.uniwersytetradom.pl/">http://www.wm.uniwersytetradom.pl/</a>			
E-mail address, phone number of the coordinator	k.osowski@uthrad.pl, phone 48 361 71 17			

**LEARNING OUTCOMES, CURRICULUM CONTENT, TEACHING CLASSES, VERIFICATION OF LEARNING OUTCOMES**

Learning Objective:	Acquisition of the ability to classify industrial robots and perform preliminary design calculations of robots industrial with the use of computer-aided machine design.
Curriculum Content:	<p>Lecture: Classification of industrial robots. Mechanical, hydraulic, pneumatic and electric drive systems. Fixed and variable gears of industrial robots. Robot grippers and manipulators. Position-force control. Environment recognition methods. Robot programming languages. Design issues of industrial robots. Examples of design solutions for industrial robots. Computer aided design of industrial robots.</p> <p>Laboratory classes: Selection and calculation of elements of the drive system of an industrial robot. Computer aided design of industrial robots.</p>
Didactic (educational) methods:	<ul style="list-style-type: none"> <li>- feeding methods (informative lecture, reading);</li> <li>- problem methods (problem lecture, conversational lecture);</li> <li>- activating methods (case method, situational method, didactic discussion);</li> <li>- programmed methods (using a computer);</li> <li>- practical methods (demonstration, calculation exercises, project method);</li> </ul>
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	<p>The condition for passing the course is to achieve all the required learning outcomes specified for a given course. Obtaining positive grades in all forms of classes included in a given course is tantamount to passing it and obtaining by the student the number of ECTS points assigned to this course.</p> <p>Lecture: the arithmetic mean of the grades obtained by the student for tests.</p> <p>Laboratory classes: final evaluation of the completed project.</p> <p>Additional elements: active participation in classes, independent work.</p>

Learning outcomes for the course in relation to the field of study learning outcomes and the type of classes				Methods of verifying learning outcomes	
Learning outcome number	Description of the learning outcomes for the course (PEU) A student who has passed the course ( <b>W</b> ) knows and understands / ( <b>U</b> ) can / ( <b>K</b> ) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment
W1	The student classifies robots based on their construction and application.	K_WG09, K_WG17, K_WG19,	lecture	graded credit	test
W2	The student knows how industrial robots are built and work.	K_WG06, K_WG08, K_WG09, K_WG10, K_WG19	lecture	graded credit	test
U1	The student is able to select a drive system with a DC electric motor to drive the robot.	K_UW02, K_UW07, K_UW08	laboratory classes	graded credit	project
U2	The student is able to design a robot drive system.	K_UW02, K_UW10	laboratory classes	graded credit	project
K1	The student is able to work in a group.	K_KO01, K_KO02	laboratory classes	graded credit	verbal assessment

Literature and teaching aids
1. Honczarenko J. i inni: Roboty przemysłowe. Budowa i zastosowanie. WNT Warszawa, 2004. 2. Morecki A.: Podstawy robotyki. WNT Warszawa 2002. 3. Craig J. J.: Wprowadzenie do robotyki. Mechanika i sterowanie. WNT Warszawa, 1993. 4. Olszewski M.: Mechatronika. REA Warszawa, 2002. 5. Olszewski M.: Manipulatory i roboty przemysłowe. WNT Warszawa, 1992. 6. Tomaszewski K.: Roboty przemysłowe. Projektowanie układów mechanicznych. WNT Warszawa 1993. 7. Dudziak M.: Przekładnie cięgnowe. PWN Warszawa, 1997.

Student workload required to achieve the assumed learning outcomes –the balance of ECTS credits			
Attendance, participation	Student workload [h].		
	Other contact hours (IGK)	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in lectures	X	X	15 [h]
Participation in laboratory classes	X	X	15 [h]
Meeting with teachers during their duty hours	2 [h]	X	X
Preparation for lectures/laboratory classes Preparation for credit	X	14 [h] 4 [h]	X
Total student workload	2 [h]/ 0,1 ECTS	18 [h]/0,7 ECTS	30 [h]/ 1,2 ECTS
ECTS credits for the course	2 ECTS		

Additional information, comments
<p>In the case of students with special needs, including disabilities, and chronic illnesses, the methods and forms of verification of learning outcomes specified above (in the syllabus) are adapted to the individual needs of these students, as appropriate.</p> <p>Detailed rules and forms of support for students with special needs, including those with disabilities and chronically ill, during classes, credits, and exams are specified in: University Regulations (Regulamin Studiów Uniwersytetu Technologiczno-Humanistycznego w Radomiu), Study Regulations (Zasady Studiowania), and Procedure for Ensuring Accessibility of the Educational Process to Students with Special Needs, Including Those with Disabilities and Chronically ill (Procedura dotycząca zapewnienia dostępności procesu kształcenia studentom ze szczególnymi potrzebami, w tym: z niepełnosprawnością, przewlekle chorych).</p>

