

# SYLLABUS

## Course description

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Course code		Course	PROJEKTOWANIE OPRZYRZĄDOWANIA TECHNOLOGICZNEGO	
MB/O/I/ST/C2A.14			DESIGN OF TECHNOLOGICAL INSTRUMENTATION	
Language of instruction		English		
Academic year		2023/2024		
field of study:		Mechanics and machine construction		
field of specialisation:		Designing and Manufacturing of Machines		
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		obligatory		
Types of classes, instruction hours, ECTS credits		Types of classes	Number of instruction hours	Number of ECTS credits
		Lecture	15[h]	2ECTS
		Classes	15[h]	
Linkage of the course	with the education profile	related to the conducted scientific activity in the discipline to which the field of study is assigned		2 ECTS
	with qualifications	it is used to acquire engineering competences by the student		2ECTS
	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		Registration for the sixth semester		
Department		Faculty of Mechanical Engineering		
Coordinator		Dr hab. inż. Marek Kowalik		
The website of the basic organizational unit		www.wm.uniwersytetradom.pl		
E-mail address, phone number of the coordinator		m.kowalik@uthrad.pl		

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

Learning Objective:	Acquisition of the ability to construct technological instrumentation, with particular emphasis on machining devices for CNC machine tools
Curriculum Content:	<p>The content of the classes is related to the conducted scientific research.</p> <p>Lecture content:</p> <p>Definitions, notations, classification of bases. Basic fixing and fixing elements and their marking. Tolerance analysis when swapping bases. Encyclopedia of Standardized Technological Instrumentation. Fundamentals of construction of devices for machining. Instrumentation of industrial robots matching the operation of CNC machine tools. Flow of items and tools on ASO and ESO. The means of transporting the item to ASO and ESO. Pallets, basing and positioning systems. Pallet changers. Warehouses of items and tools. Tool systems. Clamping, orientation, coding, identification of tools on the CNC.</p> <p>Theme of the project</p> <p>Designing special holders for machining on milling and boring centers with an indication of the concentration of machining in one operation. Device design</p> <p>adapting an industrial robot to operate a CNC machine tool.</p> <p>Designing pallets for fixing items on ESO and ASO. The student performs one topic on his own from among several presented to choose from</p>
Didactic (educational) methods:	<ol style="list-style-type: none"> <li>1. lecture with elements of multimedia presentations;</li> <li>2. didactic discussion;</li> <li>3. work in groups;</li> <li>4. laboratory experiment.</li> </ol>
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	The final grade for the lecture is determined depending on the result of the pass, the grade for project classes depends on the degree of independence of work in classes during the performance of individually assigned tasks and the project

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 ( W ) knows and understands / ( U ) can / ( K ) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment
W1	Classifies typical machine parts and assigns framework technological processes to them along with commercial universal tooling	K WG17	lecture	written exam	written exam
W2	Shows at least two variants of the machining jig concept for a given machining operation	K WG14	lecture	written exam	written exam
W3...	Evaluates the construction of a technological device in terms of technology, efficiency of use and ergonomics	K WG16	lecture	written exam	written exam
U1	He can make and discuss the design of technological tooling for machining on CNC and conventional machine tools	K UW07	laboratory	project	project
U2	He is able to consult and adapt the projects to the technical and organizational conditions of the plant	K UW09	laboratory	project	project
K1	He is ready to comprehensively analyze and effectively implement the assigned	K KK02	laboratory	observation	observation

	tasks, and in the event of difficulties in solving them, use the opinion of experts				
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Literature and teaching aids
<p>1.Feld M.: Podstawy projektowania procesów technologicznych typowych części maszyn. Wydawnictwo Naukowe PWN, WNT.Warszawa.2018 in polish</p> <p>2.Helmi Youssef ;Hassan El-Hofy: Traditional Machining Technology: Machine Tools and Operations 2nd Edition. CRC Press. 2020. ISBN 978-0367431334</p> <p>3. Helmi Youssef ;Hassan El-Hofy: Machining Technology: Machine Tools and Operations 1st Edition, CRC Press. 2008. ISBN 978-1420043396</p>

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 .... classes/laboratory classes	X	X	15[h]
Meeting with teachers during their duty hours	2 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	6[h] 12[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, przewlekłe chorych).</p>

