

# SYLLABUS

## Course description

Course code		Course	<b>OBRÓBKA SKRAWANIEM I NARZĘDZIA</b>		
MB/O/I/ST/C2A.5			<b>MACHINING BY CUTTING AND CUTTING TOOLS</b>		
Language of instruction		English			
Academic year		2023/2024			
<b>field of study:</b>		Mechanics and machine construction			
<b>field of specialisation:</b>		Designing and Manufacturing of Machines			
Educational level		first-cycle studies			
Education profile		General academic			
Mode of study		Part-time studies			
Semester(s)		5			
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	8 [h]	2 ECTS	
		Classes	12 [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 (general academic profile)			1 ECTS
	with qualifications	It is used by the student to acquire engineering competences			1 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		Qualification for the 5 <sup>th</sup> semester			
Department		Faculty of Mechanical Engineering			
Coordinator		Zbigniew Siemiątkowski, PhD Eng., Prof. UTH Rad			
The website of the basic organizational unit		<a href="http://www.wm.uniwersytetradom.pl">www.wm.uniwersytetradom.pl</a>			
E-mail address, phone number of the coordinator		z.siemiatkowski@uthrad.pl, tel. 48 361 76 17			

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

Learning Objective:	Knowledge of the machining process and the ability to measure the basic physical quantities that characterize this process
Curriculum Content:	<p><b>Lecture:</b> Introduction. Basic concepts, methods of machining, conditions and parameters of machining. Cutting tools and blade geometry. Chip formation process. Heat in the cutting process and temperature of the cutting edge. Blade wear, wear indicators, phenomena behind the blade wear and their dependence on cutting parameters. Cutting forces, their distribution and dependence on cutting parameters. Determination of consumed power for various machining methods. Vibrations in the cutting process. Materials used for cutting tool blades. Cutting fluids. Principles of selection of cutting parameters.</p> <p><b>Laboratory exercises:</b> Measurements of the geometry of cutting tool blades. Study of the relationship between the temperature of the blade and the cutting parameters in turning. Determination of chip upset coefficient and shear angle. Analysis of the influence of cutting parameters on surface roughness in turning and milling.</p>
Didactic (educational) methods:	Traditional lecture with multimedia. Laboratory classes using machine tools available in the lab.
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 the required learning outcomes.</p> <p>Positive scores on each exercise means passing the subject and achieving the respective ECTS. The final mark is calculated as follows:</p> <p><b>Lecture:</b> 90% test, 10% activity during the course</p> <p><b>Labs:</b> 60% tests before each exercise, 40% lab reports.</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 ( 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	gained knowledge on the materials processing, in particular cutting	K_WG13	lecture	Final score	test
U1	is able to plan and to perform experiments and measurements related to the main topics of cutting process	K_UW13	lab	Final score	tests and reports
U2	is able to cooperate and to work in team performing various roles	K_UO20	lab	Final score	lab reports

Literature and teaching aids
<ol style="list-style-type: none"> <li>Boothroyd G., Knight W.A.: Fundamentals of Machining and Machine Tools, Taylor &amp; Francis Group, Boca Raton, London - New York, 2006.</li> <li>Grima Getu: Analysis of Machining and Cutting Tools in Manufacturing Process, KS OmniScriptum Publishing 2019.</li> <li>Helmi A. Youssef, Hassan A. El-Hofy: Machining technology. Machine tools and operations, CRC Press Taylor &amp; Francis Group.</li> </ol> <p>And: Tool manufacturers catalogs.</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	8 [h]
Participation in .... classes/laboratory classes	X	X	12 [h]
Meeting with teachers during their duty hours	2 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	10 [h] 6 [h] 12 [h]	X
Total student workload	2 [h]/ 0,1 ECTS	28 [h]/ 1,1CTS	20[h]/ 0,8ECTS
ECTS credits for the course	50 h/ 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>