

# SYLLABUS

## Course description

Course code		Course	SYSTEMY CAM	
MB/O/I/NST/C2A.11			CAM SYSTEMS	
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		Part-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	8 [h]	4 ECTS
		Project classes	24 [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)		0 ECTS
	with qualifications	It is used by the student to acquire engineering competences		3 ECTS
	with science discipline	Mechanical engineering		4 ECTS
Form of teaching		Traditional – classes organized at the University /classes conducted using online learning methods and techniques		
Prerequisites		Qualification for the 6 <sup>th</sup> semester, fundamentals of engineering drawing, CAD systems, materials sciences, materials processing, cutting tools and processing, CNC machine tools		
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:	Ability of practical application of CAD/CAM tools in basic tasks of technological processes design for the machinery components.
Curriculum Content:	<p><b>Lecture:</b> Introduction. Historical outline of CAD/CAM systems development. Assessment criteria for CAD/CAM systems. Elements CAD in CAM software: “Design” modules (2D design and 3D elements) and “Solid.” Modeling of geometric features, edge, surface, and solid models. Exchange of drawing data between systems CAD/CAM. The use of professional CAM packages in 2D/3D machining, for example with MasterCAM or EdgeCAM programs. Batch programs in CAM systems – as elements of advanced technological design (example of the “C-hook” programs in the MasterCAM package). Computer Integrated Manufacturing (CIM) systems.</p> <p><b>Design classes:</b> Common to all discussed modules of CAD/CAM systems for turning and milling. Construction of the CAD/CAM system, discussion of each module and applications. Create simple 2D geometry for turning and milling, and importing geometry from another CAD system. Preparation of the drawing for work in the machining module, determination of the blank (stock), necessary projections auxiliary, drawing layers, etc. Postprocessor selection for a specific machine tool and control. Selection of tools and processing cycles parameters. Machining simulation. Creating a control file for the CNC machine.</p>
Didactic (educational) methods:	Traditional lecture with multimedia, design tasks.
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	The condition for passing the course is to achieve the required learning outcomes. The crediting the lecture and classes is on the basis of the accomplished exercise 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	understand and apply the basic methods and tools for simple engineering tasks concerning materials processing and machinery maintenance;	K_WG16	Lecture, classes	Final score	exercise project
U1	is able to use computer methods when solving engineering tasks on design, production, and maintenance of the machinery and devices;	K_UW05	Lecture, classes	Final score	exercise project
K1	is ready to perform analysis of the task to be solved and to fulfill it effectively, as well as to consult expert opinions when in trouble.	K_KK02	Classes	Final score	exercise project

Literature and teaching aids
<ol style="list-style-type: none"> <li>1. Verma Gaurav: Mastercam 2022 Black Book, Lightning Source Inc 2022.</li> <li>2. M. Weber: Mastercam 2021 Black Book (Colored), Cadcamcae Works 2021.</li> <li>3. EDGECAM 2023.1 CAD/CAM Release - help.</li> <li>4. R. Soenen · G. J. Olling : Advanced CAD/CAM Systems, Springer, Boston, MA 1995.</li> </ol>

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	24 [h]
Meeting with teachers during their duty hours	4 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	20 [h]/ 30 [h] 14 [h]	X
Total student workload	4 [h]/ 0,2 ECTS	64 [h]/ 2,5 ECTS	32 [h]/ 1,3 ECTS
ECTS credits for the course	100 h/ 4 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>