

## SYLLABUS

### Course description

Course code	Course	<b>INŻYNIERIA WYTWARZANIA</b>		
MB/O/I/ST/B1.9		<b>MANUFACTURING ENGINEERING</b>		
Language of instruction	English			
Academic year	2023/2024			
<b>field of study:</b>	Mechanics and machine construction			
<b>field of specialisation:</b>	All			
Educational level	first-cycle studies			
Education profile	General academic			
Mode of study	Full-time study			
Semester(s)	2, 3			
Affiliation with a group of classes	Core subjects			
Course status	Obligatory			
Types of classes, instruction hours, ECTS credits	Types of classes	Number of instruction hours	Number of ECTS credits	
	lecture	30 [h]	5 ECTS	
	classes	45 [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		5 ECTS
	with qualifications	It is used to acquire engineering competences by the student		5 ECTS
	with science discipline	Mechanical engineering		5 ECTS
Form of teaching	Traditional – classes organized at the University /classes conducted using online learning methods and techniques			
Prerequisites	knowledge and skills in the field of , in mathematics, chemistry, physics, technical drawing, acquired in high school			
Department	Faculty of Mechanical Engineering			
Coordinator	Leszek Chałko PhD Eng			
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	<a href="mailto:Leszek.chalko@uthrad.pl">Leszek.chalko@uthrad.pl</a>			

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

Learning Objective:	C1-study of the basic principles and laws related to the main technological processes of casting, welding, plastic processing and metallurgy. C2- study of basic skills in describing general concepts related to the main technological processes of casting, welding, plastic processing and metal melting processes; describing the characteristic parameters of technological processes
Curriculum Content:	Content of lectures: basic definitions and definitions in the field of mechanical engineering of production, production processes; pig iron production - blast furnace process; steel production - transformation process, steel degassing, steel solidification process; casting - solidification process, types of molds, casting system, casting methods, requirements, opportunities, products -plastic processing - types of forging processing, drawing, extrusion, stamping) and the possibility of using products formed in these processes; welding-physics and types of processes, classical welding methods. Familiarization with the production process in the foundry, production of sand molds, study of the properties of molding masses, calculation of bearing for the casting furnace, production of documentation on raw casting. Basic operations of forging, extrusion, stamping, model study of processes. Classical welding methods-gas, electric, MAG, TIG welding, laser welding, thermal cutting, electric resistance welding. Basics of electric current. Exercise content: plastic processing: materials used in plastic processing and research of their properties, cutting and stamping processes, basic stamping operations, research of sheet metal suitability for stamping processes, dimensional control in production processes, forging and extrusion processes casting: molding processes, research of molding mass properties, special casting methods. Welding: electric arc welding MMA, TIG, MIG, MAG, gas welding, laser welding, plasma cutting.
Didactic (educational) methods:	informational lecture and laboratory and computational exercises
Course assessment type, the criteria for assessing the achieved learning outcomes, and the method of calculating the final grade:	lecture: the basis of the credit is to receive (50% +1 point) the maximum number of points from the grades for the colloquium, as well as for the activity and independence of work. Laboratory exercises: the average value of the grades received by the student on the test and report, as well as for activity and independence of work

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	defines manufacturing methods such as casting, welding, plastic	K_WG13	L	Graded credit	Control Test
W2	explains the progress of technological	K_WG13	L	Graded	Control Test

	processes of casting, welding, plastic processing			credit	
U1	can distinguish the main technological processes of manufacturing machine parts	K_UW01, K_UU21, K_UW06	L;P	Graded credit	Control project
U2	can describe the technological processes and assess their suitability for the manufacture of basic elements cars.	K_UW01, K_UU21, K_UW06	P	Graded credit	Control project
K1	is aware of the need to expand knowledge in the field of mechanical engineering and can choose the right methods to expand this knowledge to effectively solve technical	K_KK01	L;P	Verbal	Conversation
K...					

#### Literature and teaching aids

1. Perzyk M., Waszkiewicz S., Kaczorowski M., Jopkiewicz A.: Odlewnictwo. Warszawa WNT 2000.
2. Praca zbiorowa: Spawalnictwo. Laboratorium. PR. Radom 2002.
3. Mazurkiewicz A., Kocur L.: Obróbka plastyczna. Laboratorium. Radom, PR 2006.
4. Kuzioła A.: Metalurgia i odlewnictwo. PR. Radom. 2011
5. Kowalski T.: Technologia i automatyzacja montażu. OWPW, W-wa, 2006.

#### 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	30 [h]
Participation in .... classes/laboratory classes	X	X	45 [h]
Meeting with teachers during their duty hours	2 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit / exam	X	42 [h] 6 [h]	X
Total student workload	2 [h] / 0.1 ECTS	48 [h] / 1.9 ECTS	75 [h] / 3 ECTS
ECTS credits for the course	125 [h] / 5 ECTS		

#### Additional information, comments

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.

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).

