

SYLLABUS

Course description

Course description				
Course code		Course	Maszynoznawstwo	
MB/O/I/ST/B3			Theory of machines	
Language of instruction		English		
Academic year		2025/2026		
field of study:		Mechanical Engineering		
		All		
field of specialisation:				
Educational level		first-cycle studies		
Education profile		General academic		
Mode of study		Full-time studies		
Semester(s)		1		
Affiliation with a group of classes		A. Group of basic course		
Course status		Obligatory		
Types of classes, instruction hours, ECTS credits		Types of classes	Number of instruction hours	Number of ECTS credits
		Lecture	30 [h]	2
		Classes	[h]	
		Lab	[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		ECTS
	with qualifications	It is used to acquire engineering competences by the student		2 ECTS
	with science discipline	Mechanical engineering		ECTS
Form of teaching		Traditional – classes organized at the University /classes conducted using distance learning methods and techniques		
Prerequisites		knowledge of mechanics (statics) and mathematics		
Department		Faculty of Mechanical Engineering		
Coordinator		Prof dr hab.inż. W.Żurowski		
The website of the basic organizational unit		http://wm.uniwersytetradom.pl		
E-mail address, phone number of the coordinator		wojciech.zurowski@uthrad.pl		

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

Learning Objective:	C1 – Familiarization of students with basic concepts and issues related to types of energy and its resources.
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	<p>C2 - Familiarization of students with classification of machines and devices according to the adopted criterion.</p> <p>C3 - Familiarization of students with concepts related to construction and operation of machines and devices.</p> <p>C4 – Familiarization of students with the principle of operation of a machine, e.g. a heat engine, water turbine, pump, etc.</p> <p>C5 - Familiarization of students with factors causing wear of machines.</p>
Curriculum Content:	<p>The content of the classes is related to the conducted scientific research.</p> <p>In: Types of energy and its resources. Criteria and classification of machines. Determination of basic technical parameters of machines. Review and basic knowledge of hydrostatics.</p> <p>Pascal's law and its application in the construction of hydraulic machines. Fluid buoyancy and equilibrium of floating bodies. Fluid movement and its parameters. Basic laws of hydrodynamics.</p> <p>Types, construction and operating principle of water turbines and their technical parameters. Classification and general characteristics of pumps. Principle of operation, types of volumetric (displacement) and flow pumps. Examples of pumping installations. Hydraulic drives. Characteristics and components of hydrostatic drives. Construction and application of hydrokinetic drives, e.g. gears and clutches. Outline of technical thermodynamics. Thermodynamic factor and its state parameters. State transformations of an ideal gas. Thermodynamic cycles. Classification of technical fuels. Types of heat exchange. Properties of steam. Steam engines and thermal power plants. Construction and basic elements of the boiler installation. Combustion engines. Characteristics and classification of internal combustion engines. Combustion turbines and jet and rocket engines. Compressors, fans and blowers - classification, application. Construction of positive displacement and flow compressors. General characteristics of vacuum pumps. Pneumatic mechanisms. Construction and application of pneumatic and pneumohydraulic drives. Refrigerators - types, operating principle and application. Short-range transport devices. Characteristics of cranes and conveyors. Typical design solutions of cranes and their technical parameters. Types and application of conveyors in production processes. Operation of machines and devices. Types of wear of machines and devices. Factors influencing machine wear processes. Durability and reliability of machines and devices.</p>
Didactic (educational) methods:	Informative and problem-based lecture with elements of discussion, using expository methods (film, ppt presentation)
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 all the required learning outcomes specified for the course....

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
1	Classifies machines and devices according to the adopted criterion.	K_WG10	Lecture	exam	written exam
2	Knows the factors causing wear of machines and accurately assesses the intensity of their impact on this process.	K_WG10	Lecture	exam	
3	Is able to use concepts from the scope of construction and operation of machines and devices.	K_UW14		exam	written exam
4	Is aware of the need to supplement knowledge throughout life.	K-KK01			

Literature and teaching aids
<p>Primary literature:</p> <ol style="list-style-type: none"> 1. Bartkiewicz J.: Maszynoznawstwo. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1994. 2. Biały W.: Podstawy maszynoznawstwa. Wydawnictwo Politechniki Śląskiej, Gliwice 2002. 3. Poradnik inżyniera mechanika, WNT, Warszawa, 1974. <p>Additional literature:</p> <ol style="list-style-type: none"> 1. Chomczyk W.: Basics of machine design, PWN Scientific Publishing House, 2017 2. Sell L.: General machine science and machine parts (in questions), WNT, Warsaw, 1980. 3. Chwiej M.: General machine science, PWN, Warsaw, 1983.

Student workload required to achieve the assumed learning outcomes – the balance of ECTS credits		
Attendance, participation	Student workload [h].	
	Student's self-study hours Classes without a teacher (ZBN)	Classes
Participation in lectures/classes/lab	X	30 [h]
Preparation for lectures/classes/lab , Preparation for ... credit / exam	20 [h]	X
Total student workload	20 [h]/ 0,8 ECTS	30 [h]/ 1,2 ECTS
ECTS points per subject	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>

