SYLLABUS

Course description

Course code	Course	Eksploatacja maszyn	
ME/O/I/NST/C8b		Machine maintenance	
Language of instruction	English		
Academic year	2025/2026		
field of study:	Mechanical Engineering		
field of specialisation:	All		
Educational level	first-cycle studies		
Education profile	General academic		
Mode of study	Part-time studies		
Semester(s)	6		
Affiliation with a group of classes	C. Group of courses to choose from		
Course status	Electable		
Types of classes, instruction hours, ECTS credits	Types of classes	Number of instruction hours	Number of ECTS credits
	Lecture	8[h]	5ECTS
	Classes	[h]	
	Lab	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		ECTS
Linkage of the course – with qualifications	It is used to acquire engineering competences by the student		5 ECTS
Linkage of the course – with science discipline	Mechanical engineering		5 ECTS
Form of teaching	Traditional – classes organized at the University /classes conducted using distance learning methods and techniques		
Prerequisites	not valid		
Department	Faculty of Mechanical Engineering		
Coordinator	PhD Tomasz Skrzek		
The website of the basic organizational unit	http://wm.uniwersytetradom.pl		
E-mail address, phone number of the coordinator	t.skrzek@urad.edu.pl		

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

Learning Objective:	The goal is to provide students with knowledge and develop appropriate skills in the basic issues related to the operation and servicing of machines, their reliability, diagnostics, and

	repair technologies.
Curriculum Content:	Lecture: presentation of the course syllabus, assessment criteria, literature, and health and safety regulations. The origin of the science of maintenance. Phases of the existence of a technical object. The subject of maintenance theory. Vehicle maintenance principles. Maintenance strategies. Operation of equipment. Friction. Wear of machines and technological devices. Lubrication and operating fluids. Basic concepts of reliability. Basic assumptions of diagnostics in machine maintenance. Types of machine tests. Examples of physical processes as sources of diagnostic signals. Technological process of machine repairs. Verification and regeneration of machine parts. Methodology for implementing a technical maintenance system. Laboratory: Measurement of wear in components of selected mechanical engine assemblies. Testing of operating fluids in machines. Computer-aided support in machine diagnostics and their working processes. Environmental aspects of machine operation. Maintenance and repair of selected mechanical assemblies.
Didactic (educational) methods:	**Lecture** with the use of multimedia techniques, including elements of discussion on various design solutions presented by the lecturer using slides and films. **Laboratory exercises** utilizing research stations and modern measuring equipment involve practical familiarization with different design solutions and performing measurements to prepare various engine characteristics.
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 out comes specified for the course. In the case of the lecture, the grade is based on the result of a test. Laboratories are graded based on the average scores from the entry tasks and the acceptance of subsequent reports on the exercises performed by the instructor.

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	Student knows the construction of a car as an example of a complex machine, recognizes and describes various design solutions used in vehicles, and can identify different types of characteristics of the machine operation process, focusing on the reliability of their performance and diagnostics.	K_WG09	lecture	written exam	Theoretical test
U1	The student is able to present the development path of systems used in cars, identify interdependencies between key parameters describing their performance, and apply this knowledge to assess the reliability and operational characteristics of cars.	K_UW07	laboratory work	written work and laboratory report	Control work
K1	The student is aware of the ongoing changes in machine construction, including cars, understands the need to continuously update their knowledge, and	K_KR06	laboratory work	written work and laboratory report	Control work

	recognizes the risks associated with vehicle operation, as well as the importance of effective diagnostics and repair technologies in maintaining machines.				

Literature and teaching aids
1. Productivity and Reliability-Based Maintenance Management, M. Stephens, 2010 2. Khalid Tantawi, I. Fidan, A. Tantawi "Status of Smart Manufactring in the United States", IEEE SoutheastCon. Huntsville, AL, 2019 3. St. Legutko: „Eksploatacja maszyn", Wyd. Politechniki Poznańskiej, Poznań 2007. 4. Napiórkowski J. i inni: Podstawy budowy i eksploatacji pojazdów i maszyn. Uniwersytet Warmińsko-Mazurski w Olsztynie. Olsztyn 2013. 5. St. Legutko: „Podstawy eksploatacji maszyn i urządzeń", Wydawnictwa Szkolne i Pedagogiczne, Warszawa 2010. 6. Praca zbiorowa: „Podstawy racjonalnej eksploatacji maszyn", Wyd. Instytutu Technologii Eksploatacji, Radom, 1996. 7. Gwidon Stachowiak, Andrew W. Batchelor: Engineering Tribology, Elsevier Inc., 2005, ISBN-13: 978-0750678360. 8. Heinz P. Bloch, Fred K. Geitner: Machinery Failure Analysis and Troubleshooting, Gulf Professional Publishing, Houston Texas, 1999, ISBN-13: 978-0123860453. 9. Neville W. Sachs: Practical Plant Failure Analysis, Dekker Mechanical Engineering, CRC Press, 2006, ISBN-13: 978-0849333767. 10. https://blog.utc.edu/khalid-tantawi/files/2021/01/Lesson-1-Introduction-to-Maintenance.pdf 11. https://funaab.edu.ng/wp-content/uploads/2009/12/470_MCE%20509%20LECTURE%20NOTE.pdf

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	32[h]
Preparation for lectures/classes/lab	93 [h]	X
Total student workload	93[h]/ 3.7ECTS	32[h]/ 1,3ECTS
ECTS points per subject	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).