

# SYLLABUS

## Course description

Course code	Course	NAUKA O MATERIAŁACH	
MB/O/I/NST/B1.2		MATERIALS SCIENCE	
Language of instruction	English		
Academic year	2023/2024		
field of study:	Mechanics and machine construction		
field of specialisation:	all		
Educational level	first degree studies		
Education profile	general academic		
Mode of study	part-time studies		
Semester(s)	1, 2		
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	16 [h]	7 ECTS
	Laboratory classes	12/16 [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	7 ECTS
	with qualifications	It is used to acquire engineering competences by the student	7 ECTS
	with science discipline	Mechanical engineering	7 ECTS
Form of teaching	Traditional – classes organized at the University /classes conducted using online learning methods and techniques		
Prerequisites	Basic knowledge acquired in high school		
Department	Faculty of Mechanical Engineering UTH Radom		
Coordinator	Piotr Sadowski, BEng, PhD		
The website of the basic organizational unit	www.mechaniczny.uniwersytetradom.pl		
E-mail address, phone number of the coordinator	<a href="mailto:p.sadowski@uthrad.pl">p.sadowski@uthrad.pl</a> 48 361 76 27		

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

Learning Objective:	Gaining knowledge in the field of construction and properties of materials depending on the chemical composition, phase and microstructure, as well as acquiring skills and competence in the selection of materials for technical applications.
Curriculum Content:	<p><b>Lecture content:</b> Matter and its components (2h). Natural and engineering technical materials - comparison of their structure, properties and applications (2h). Elements of crystallography and the basics of solidification (2h). Phase changes (2h). Strengthening of materials, shaping the structure and properties of engineering materials (2h). Steels and cast iron alloys (4h). Heat and thermo-chemical treatment of iron alloys (2h). Non-ferrous metals and their alloys (4h). Sintered and ceramic materials (2h). Glass and glass ceramics (2h). Polymer and composite materials (2h). Material testing methods (2h). Working conditions and mechanisms of wear and decohesion of engineering materials (2h).</p> <p><b>Content of laboratory exercises:</b> Introductory information and OHS training (2h), Construction, operation and operation of a metallographic microscope (2h). Crystal structure analysis (2h). Macroscopic examinations (2h). Testing the hardness of materials (2h). Analysis of the structure of alloys using phase equilibrium systems (2h). Analysis of the structure and properties of carbon steel and cast steel (2h). Analysis of the structure and properties of cast iron (2h). Analysis of the structure and properties of non-ferrous metals and their alloys (6h). Analysis of the structure and properties of steel and alloys after heat treatment (2h). Steel hardenability test (2h). Identification of plastics(2h). Corrosion and protection against corrosion (2h) Qualitative and quantitative assessment of the structure (2h), Analysis of sintered materials (2h), supplementing, correcting and passing</p>
Didactic (educational) methods:	feeding methods (informative lecture), - activating methods (didactic discussion), - exposing methods (exhibition, show), - practical methods (demonstration, laboratory exercises)
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 subject. The average grade obtained from the entrance tests on individual laboratory exercises and the grade from the written exam from the lectures. Submission of all lab reports.

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 ( <b>W</b> ) knows and understands / ( <b>U</b> ) can / ( <b>K</b> ) is ready to:	Field of study learning outcome (KEU)	Types of classes	Form of verification (credits)	Methods of testing and assessment

W1	Has knowledge of engineering materials, their research and shaping technologies;	K_WG13	Lecture Laboratory exercises	Exam Passing individual practical exercises	Arithmetic mean of the grades of partial questions, Arithmetic mean of grades from practical exercises
U1	Is able to select appropriate engineering materials to ensure proper operation of machinery and equipment;	K_UW11	Lecture Laboratory exercises	Exam Passing individual practical exercises	Arithmetic mean of the grades of partial questions, Arithmetic mean of grades from practical exercises
K1	Is aware of the need to supplement knowledge throughout life and is able to choose the right teaching methods for himself and other people.	K_UU21	Lecture Laboratory exercises	Exam Passing individual practical exercises	Arithmetic mean of the grades of partial questions, Arithmetic mean of grades from practical exercises

Literature and teaching aids			
1. Wojtkun F., Sołncew J. P.: Materiałoznawstwo. T. I i II. Wyd. Politechniki Radomskiej. Radom 1999. 2. Lisica A., Ostrowski B., Ziewiec W.: Laboratorium materiałoznawstwa. Wyd. Politechniki Radomskiej, Radom 2006. 3. Lisica A.: Inżynieria materiałowa w wybranych pytaniach i odpowiedziach. Wyd. Politechniki Radomskiej. Radom 2005. 4. Przybyłowicz K., Metaloznawstwo. WNT 2003. 5. Dobrzański L. A.: Podstawy nauki o materiałach i metaloznawstwo. Materiały inżynierskie z podstawami projektowania materiałowego. WNT, Warszawa 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	16 [h]
Participation in .... classes/laboratory classes	X	X	28 [h]
Meeting with teachers	10 [h]	X	X
Preparation for lectures/classes/.... , Preparation for ... credit /	X	30/56 [h] 35[h]	X
Total student workload	10 [h]/ 0,4 ECTS	121 [h]/ 4,7ECTS	44[h]/ 1,8 ECTS
ECTS credits for the	7 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>