



UNIVERSITETI / UNIVERSITY
"ISA BOLETINI"
MITROVICË

Course Curriculum Model (Syllabus)		
Faculty:	FACULTY OF MECHANICAL AND COMPUTER ENGINEERING	
Department:	Mechanical Engineering	
Level:	Bachelor	
Code of the course:	109ME	
Course:	Materials engineering	
Course Status:	-	Mandatory
Semester:	(II)	Sumer
Number of hours per week:	3+2	
ECTS:	6	
Time / location:	Monday, 9 ⁰⁰ -10 ³⁰ , S308	
Year of studies:	2024/2025	
Lecturer:	Prof Ass Dr. Fitim Zeqiri	
Assistant:	MSc Granit Hajra, PhD(c)	
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	Telefon:	
Co u r s e D e s c r i p t i o n	This course provides a comprehensive exploration of the fundamental principles and applications in the field of materials technology. It offers a broad understanding of various material classes, their properties, and applications in diverse industries. Through theoretical concepts and practical applications, students will gain insights into the role of materials in modern technology and engineering.	
Pu r p o s e	The purpose of the "General Technology of Materials" course is to provide students with a comprehensive understanding of the foundational principles and practical applications within the field of materials technology.	
Le a r n i n g O u t c o m e s	<p>After learning the course the students should be able to:</p> <ul style="list-style-type: none"> - Explain importance of materials in materials science and engineering field. - Give information about atomic structure, atomic bonds, crystal structure, crystal geometry and crystal defects. - Explain solidification, crystal defects and diffusion in solids. - Give information about electrical properties of materials. - Interpret mechanical properties of materials. - Give information about metal, polymer, ceramic and composite materials and their properties. - Give information about phase diagrams. 	

	Weeks	Lecture
P r o g r a m	<i>First week:</i>	Introduction in Materials science and Engineering - classification of materials and application.
	<i>Second week:</i>	Atomic Structure, Atomic Bonding in Solids
	<i>Third week:</i>	The Structure of Crystalline Solids

Fourth week:	Mechanical properties of Metals, Concepts of stress and strain
Fifth week:	Elastic Deformation, Plastic Deformation, Property Variability And Design/Safety Factors
Sixth week:	Dislocations and plastic deformation, Mechanisms of strengthening in Metals, Recovery, Recrystallization, And Grain Growth
Seventh week:	Introduction to material testing. Static testing. Hardness, toughness and fatigue tests.
Eighth week:	Technological tests. Non-Destructive Testing. X-ray and γ -ray testing.
Ninth week:	Ultrasonic testing. Magnet particle testing. Liquid penetrant testing.
Tenth week:	Failure, Fundamentals of Fracture, Fatigue, Creep
Eleventh week:	Phase Diagrams: Definitions And Basic Concepts, Binary Phase Diagrams, The Iron–Carbon System
Twelfth week:	Phase Transformations: Development of microstructure and alteration of mechanical properties
Thirteenth week:	Applications and processing of metal alloys
Fourteenth week:	Casting. Sand, shells and die casting. Precise casting. Pressure casting. Centrifugal casting. Construction castings.
Fifteenth week :	Powder metallurgy. Corrosion of metals. Corrosion protection

Literature	
L i t e r a t u r e	<p>[1]. Zeqiri H, Osmani H, <i>Teknologjia e përgjithëshme e materialeve</i>, UIBM 2021.</p> <p>[2]. Baholli B, I. Hoxha, G. Demiraj, E. Lamani, <i>Struktura dhe përpunimi termik i metaleve</i>, Universiteti i Tiranës, Fakulteti i Inxhinierisë Mekanike, Tiranë, 2006</p> <p>[3]. Osmani H, Bytyqi B, <i>Materialet e Makinerisë</i> – Ushtrime Laboratorike 2010.</p> <p>Recommended Literature:</p> <p>[1]. Herrmann Schumann, Heinrich Oettel, <i>Metallografie</i>, 14 Auflage, WILEY-VCH Verlag GmBH&Co. KgaA, 2005</p> <p>[2]. William D. Callister, Jr. <i>Materials Science and Engineering an Introduction</i>, Sixth edition</p>

T e a c h i n g m e t h o d o l o g y	Lectures, exercises, individual work, experimental work, seminar papers, colloquia, essays, field work, group work, etc. Completed according to the specifics of your subjects!			
	Contribution to student workload (which should correspond to student learning outcomes - 1 ECTS credit = 25 hours)			
	Activity	Hours	Days/weeks	Total
	Lectures	3	15	45
	Exercise sessions (with TA)	2	15	30
	Practical work	2	5	10
	Office hours	2	2	4
	Fieldwork	2	5	10
	Midterms, seminars	2	4	8
	Homework	2	5	10
	Self-study	2	4	8
	Final exam preparation	3	5	15
	Time spent in exams	2	2	4
	Projects, presentations, etc.	3	2	6
Total			150	

E v a l u a t i o n	Teaching methodology: (according to the Statute and Regulation for studies of UMIB)		
	Tests / Colloquia (First Test) (Second test)		10% 10% 10%
	Practical test during exercises (Essay)		
	Workshop seminar		
	Interpretation and presentation of artistic creativity and other works.		
	Assignments and courses during the semester		15%
	Professional practice.		
	Other, Continuity		
	Final exam		55%
	Total	:	100%
	Final grade	Percent (%)	Grade
		91 – 100	10
		81 - 90	9
		71 - 80	8
	61 - 70	7	
	51 - 60	6	

Criteria for regular attend. and rules of etiquette during the organization of the lesson are set.

Computer work:

Graphic works, I have to draw and write with a computer. In the works it is obligatory to respect the criteria for both the visual and the content aspect of the required works.

Ethics in teaching:

Graphic works should be personal works of each student. There will be no tolerance for copying, "borrowing" from the Internet or any other material. The same or similar works will have negative evaluations in the final evaluation of the student.

Time:

In agreement with the students, the deadlines for submitting works will be determined. There will be no tolerance for delays in the submission of works. Failure to arrive at the time when the assignment is explained does not justify the student for not submitting the paper. The deadline will be given earlier. If you are going to travel abroad, then you need to submit the paperwork in advance. The student has the right to request a consultation with the professor whenever he / she deems it reasonable and necessary for the performance of his / her work.

Rules of conduct and academic policies:

- active participation of students in lectures o participation in discussion, comments and free expression of opinion, opinion and academic position (with arguments)
- Mandatory independent work and use of additional sources of information (various scientific websites, scientific journals, conference proceedings, etc.)
- Respecting lecture schedules without compromising academic freedom (silent cell phones) of respecting the word, thoughts and ideas of colleagues,
- It is not allowed to arrive late and leave without a valid reason from the lecture, test or exam o preparation and holding of relevant lectures, (obligation of the teacher).
- if the student is absent more than four times without reason in lectures and exercises, does not receive the signature for attendance. o the student cannot take the exam without an official document,

if the student is dissatisfied with the grade obtained, has the right to complain in writing to the dean, within two working days after the announcement of the results, UMIB Statute o if the student does not follow the rules, in the exam uses tools that are not allowed, it is evaluated with a negative grade.