PHYSICAL METALLURGY		
Faculty:	Faculty of Geosciences	
Name of study program:	**Materials and Metallurgy**	
Department:	**Materials and Metallurgy**	
Level:	MASTER	
The code of subject:	1	
Subject:	**PHYSICAL METALLURGY**	
Subject Status:	M /Winter	(Winter / Summer)
Semester:	**I**	(According to approved programe)
Total hours:	3+2	(According to approved programe)
ECTS:	7	(According to approved programe)
Schedule / Hall	2020/2021	
Academic year:	**Muharrem Zabeli**	
Professor:		
Assistants:	Lecturer:	Assistant
Email:	Muharrem.zabeli@umib.net	
Telefon:	+38328535725	
Course description:	Physical metallurgy is a field of study within metallurgy where the focus is on the physical properties and structure of metals and alloys. The importance of materials, the economic aspect of materials, resources, material concept and classification of materials. Substances and materials. Classification of materials development materials, properties of materials, selection of materials, structures and coordinates ngurta.Lidhjet stages, items, directions and flat, ndermetalike phases quasi-crystalline phases and glass hardening of materials. Passing the state of the gaseous and liquid in the solid, creation of embryos, creation of embryos heterogeneous,etc.	
Course objectives:	The main objectives are the acquirement of a sound background in Physical Metallurgy, as well as the understanding of and familiarization with the fundamental principles of Physical Metallurgy (Phase diagrams, phase transformations, heat treatments, aging and precipitation hardening etc).	

Learning outcomes:	Upon completion of the course, the student has acquired: · the necessary background to design/select the necessary heat treatment for attaining the appropriate microstructure for the desired properties · the ability to predict appropriate alloys/heat treaments · the ability to understand/predict the behavior of a metallic material to a certain application · the ability to recognize and identify the phases in metallic materials and their effect on their properties	
Designed study plan:	Week	Lectures which will be held
	First week:	The structure and bonding of atoms
	Second week:	Atomic arrangements in materials
	Third week:	Structural phases; their formation and transitions. Crystallization from the melt
	Fourth week:	Principles and applications of phase diagrams
	Fifth week:	Defects in solids
	Sixth week:	The characterization of materials
	Seventh week:	The physical properties of materials
	Eighth week:	Mechanical behaviour of materials
	Ninth week:	Strengthening and toughening
	Tenth week:	Modern alloy developments
	Eleventh week:	Ceramics and glasses
	Twelfth week:	Plastics and composites
	Thirteenth week:	Corrosion and surface
	Fourteenth week:	Biomaterials
	Fifteenth week:	Materials for sports

Literature	Basic	*1. Hamit Mehmeti, Metalzrgjia fizike, UMIB, 2014* *2. GREGORY N. HAIDEMENOPOULOS, PHYSICAL METALLURGY -PRINCIPLES AND DESIGN © 2018 by Taylor & Francis Group* *3. R. E. Smallman & A. H.W. Ngan, "Physical Metallurgy and Advanced Materials" Seventh edition, ISBN: 978 0 7506 6906 1, © Butterworth-Heinemann is an imprint of Elsevier 2007*
	Additional	1. R. E. Smallman & A. H.W. Ngan, "Physical Metallurgy and Advanced Materials" Seventh edition, ISBN: 978 0 7506 6906 1, © Butterworth-Heinemann is an imprint of Elsevier 2007 2. Robert W. Cahn and Peter Haasen , " PHYSICAL METALLURGY", Volume I, II dhe III, North-Holland,
Teaching methods		Interactive lectures, numerical and exercises. Tests during lectures

Contribution on student load

Activity	Hours	Days/week	Total
Lectures	3	15	45
Exercise theoretical/laboratory	2	15	30
Practice work			
Contact with lecturer/consultations	2	2	4
Field exercises	-	-	-
Mid-terms, seminars	2	2	4
Homework	2	3	6
Individual time spent studying (at the library or home)	3	15	45
Final preparation for the exam	9	1	9
Time spent in evaluation (tests, quiz, final exam)	2	3	6
Projects, presentations, etc.	1	1	1
Total			**150**

<table>
<tr><td>Evaluation methods</td><td><table>
<tr><td>Tests / Colloquia</td><td>2x15 (%)</td></tr>
<tr><td>Practical test during exercises</td><td>10 (%)</td></tr>
<tr><td>Seminar paper</td><td>10 (%)</td></tr>
<tr><td>Homework during the semester</td><td>10 (%)</td></tr>
<tr><td>Final exam 40 (%)</td><td>40 (%)</td></tr>
</table></td></tr>
<tr><td>Academic policies and rules of conduct:</td><td>Regular attendance is required of students in lectures and exercises.

Rules of conduct as quieting learning, access to the hall of learning time, turn off cell phones, etc. are also mandatory.</td></tr>
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