

Faculty:	GEOSCIENCES	
Name of study program:	Metallurgy	
Department:	Materials and Metallurgy	
Level:	Master	
The code of subject:	2	
Subject:	Ferroalloys	
Subject Status:	Compulsory	(Compulsory or Elective)
Semester:	III	(Winter / Summer)
Total hours:	3+2	(According to approved programme)
ECTS:	6	(According to approved programme)
Schedule / Hall		
Academic year:		
Professor:	Prof.Dr.Zarife Bajraktari-Gashi	
Assistants:		
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BRIEF CONTENT OF SUBJECT	The course deals with the basics of ferroalloys, thermodynamics, kinetics and reduction and general processing issues, electric furnace operation as well as environmental issues. The theory and technology of ferroalloys with Si, Mn, Fe-Ni, Fe-Cr, Fe-Si, the last part examines all other relevant industrial ferroalloys, as well as the features of their processing applications. The course is accompanied by the numerical, industrial and laboratory part.	
AIMS	The aim of the course is to train students to apply theoretical knowledge to solve certain problems from industrial practice in metallurgical processes.	
EXPECTED LEARNING OUTCOMES	At the end of the course students are expected to be able to: 1. Analyze the development history of ferroalloy products. 2. Understand the alloying elements and select ferroalloys for steels. 3. Analyze the properties and durability of ferroalloys. 4. Determine the properties for each ferroalloy and their characteristics. 5. Evaluate the durability of ferroalloys. 6. Submit syntheses for electricity costs during the utilization processes of. 7. Present a synthesis for the improvement of the process in the furnace from the acquired knowledge.	
PROGRAM	Weeks	General basics of ferroalloys
	Week - I	INTRODUCTION TO FERROALLOYS
	Week - II	Basics of Ferroalloys

	Week - III	Theory of Ferroalloys Processing
	Week - IV	Ferroalloys components and their properties
	Week - V	Ferroalloys Processing Equipment
	Week - VI	Ferrochrome, Ferrosilicon, Ferromanganese, and Silicomanganese Furnaces
	Week - VII	Equipment for furnace feed processing First test
	Week - VIII	Electric and Thermal Operations of Furnaces for Ferroalloys Production
	Week - IX	Modes of heat dissipation in furnaces
	Week - X	Ferrosilicon and Silicon Technology
	Week - XI	Ferronickel (Fe-Ni)
	Week - XII	Ferroalloys (Fe-Mn), Alloys Mn
	Week - XIII	Dispersion of Ferroalloys (powder)
	Week - XIV	Calculation of the load for melting Ferrosiliconmanganite and high carbon ferrochrome
	Week - XV	Environmental protection in the ferroalloy industry The second test
LITERATURE	1. Michail Gasik; Viktor Dashevski; Aitber Bizhanov "Ferroalloys Theory and Practice" ISBN 978-3-030-57502-1 © Springer Nature Switzerland AG 2020 2. B.P Bhardwaj "The Complete Book on Ferroalloys", 2014 3. Michael Gasik "Handbook of Ferroalloys: Theory and Technology", 2013 4. Zarife Bajraktari-Gashi "Nikeli dhe përfitimi i ferronikelit në Drenas" 2022 5. Agron Dhima "Bazat e metalurgjisë ekstraktive" Tiranë, 2010 www.microsilicafume.eu https://eippcb.jrc.ec.europa.eu/sites/default/files/2020-01/JRC107041_NFM_bref2017.pdf.	
TEACHING METHODOLOGY	<u>Lectures, practical part, group work, experimental work, seminar papers, etc.</u>	

	Contribution to student workload (which should correspond to student learning outcomes 1 ECTS credit = 25 hours)			
	Activity	Hours	Day/Week	Total
	Lectures	3	15	45
	Exercise sessions - theoretical	2	15	30
	Field exercises			
	Practical work	1	2	2
	Consultation with the professor / assistant			
	Colloquiums / seminars	1	15	15
	Independent tasks (work)	1	2	2
	Student self study time (in library or at home)	4	15	60
	Final exam preparation	7	1	7
	Time spent in assessment (tests, quizzes, final exams)	2	5	10
	Projects, presentations, etc.	1	1	1
	Total			176
EVALUATION	Evaluation methods			
	[according to the Statute and Regulation of UMIB Studies]			
	Tests		2x15(%)	
	Practical test during exercises		10%	
	Seminary work (in word)		10%	
	Interpretation and presentation of seminary work		10%	
	Tasks and essays during the semester			
	Final exam		40%	
	ACADEMIC POLICIES	Seminars and presentations must be written on a computer and students will be given deadlines for submitting seminars, presentations and assignments.		
During the student evaluation, active participation in lectures and practice Industrial will be taken into account, for example: discussions, comments and free expression of opinion, opinion and academic position (with arguments). Also, it will be mandatory to work independently and use additional sources of information (various scientific websites, scientific journals, conference proceedings, etc.)				
	The obligation of the teacher is to prepare and equip with the relevant lectures.			