

Subject specification for the book of subjects

Study program		All, except Chemistry		
Optiononal area (module)				
The type and level of study		PhD studies		
Course Title		Higher course of metallurgical processes		
Professor (for lectures)		Željko Kamberović		
Professor/assistant (for practice)				
Professor/assistant (for LAB)				
Number of ECTS		5	Subject status (obligatory/elective)	elective
Prerequisite	no			
Objective of the course	The main objectives of the course are: to prepare for independent performing of engineering calculations of thermodynamic and kinetic parameters of the reaction in metallurgical processes, independent research and the basic mechanisms of the processes in metallurgy.			
Learning outcomes of the course	Students are qualified to independently perform engineering calculations of thermodynamic and kinetic parameters of the reaction of metallurgical processes, independent research, the basic mechanisms of the processes in metallurgy, with aim of applications in various technological schemes of metals obtaining, refining and recycling.			
Course contents				
Theoretical contents	Through this course, students master the basics of the thermodynamic and kinetic of pyro-and hydro-metallurgical processes, reaction mechanisms and possibilities of their use in metal extraction and processing of metallic materials. Seminar paper is required. The course introduces to students the basic principles of metallurgical processes applied in the technology of iron and steel, ferro-alloys, non-ferrous and rare metals from primary and secondary raw materials. Students will become familiar with the processes that are carried out at high temperatures, such as calcination processes, oxidation, reduction, combustion, chlorination, sulfidization and agglomeration of ore particles and concentrates. Obtaining of high temperature will be analyzed, the formation structure and properties of melt and oxide systems will be examined.			
Practice (exercises, DON, research in studies)				
Literature				
	1	Rosenqvist, T., Principles of extractive metallurgy, 2nd Edition, New York, 1983		
	2	Bodswort C., Bell H.B., Physical chemisry of Iron and Steel manufacture, 1995		
	3	Davenport W.G., Flash smelting, University of Arizona, Tucson, Pergamon press, 1987		
	4	Voljskij A.H., Sergijevsaja, Teorija metallurgičeskih processov, Metalurgija, Moskva, 1988		
	5	Coudurier, Hopkins, Wilkomirsky, Fundamentals of Metallurgical Processes, Pergamon, 1998		
	6	A.N. Zelikman, G.M. Voldman, L.V. Belyevska, Theory of Hydrometallurgical Process, Metallurgii, Moscow, 1993		
Number of active lecture classes per a week during semester/trimester/year				
Lectures	Practices	LAB	Research in studies	Other classes
2				
Teaching methods	Classes are held in the form of lectures. Students are required to do seminar paper.			
Оцена знања (максимални број поена 100)				
Pre-exam obligations	points	Final exam		points
Activity during lectures	10	Written exam		60
Practical assesments	-	Oral exam		-
Colloquiums	-			
Seminars	30			