
	UNIVERSITY OF EAST SARAJEVO					
	Faculty of Technology Zvornik					
	<i>Study programme: Chemical Engineering and Technology</i>					
	Cycle I		Year IV			
Course title	ALUMINA TECHNOLOGY					
Department	Department for Chemical Technology – Faculty of Technology Zvornik					
Course code		Course status		Semester	ECTS	
04-2-039-7		Elective		VII	5	
Teacher	Dr Dragana Kešelj, Associate Professor					
Teaching assistant	Dr Dragana Kešelj, Associate Professor					
Number of classes/ teaching workload (per week)			Individual student workload (in hours per semester)			Student workload coefficient S₀
Lectures	Auditory exercises	Laboratory exercises	Lectures	Auditory exercises	Laboratory exercises	S₀
2	0	2	45	0	45	1.5
$2*15 + 0*15 + 2*15 = 60$ hours			$2*15*1,5 + 0*15*1,5 + 2*15*1,5 = 90$ hours			
Total course workload 60 + 90=150 hours per semester						
Learning outcomes	<p>After finishing the course, students will be able to:</p> <ol style="list-style-type: none"> 1. demonstrate theoretical knowledge in the fundamentals of chemical processes that are the basis of alumina production technologies 2. manage the technological (Bayer) process of obtaining alumina 3. calculate the material and energy balance of the Bayer process of alumina production 4. demonstrate knowledge of the working conditions of the main stages of the Bayer process of alumina production and their influence on the use of alumina during production 					
Prerequisites						
Teaching methods	Lectures, auditory and laboratory exercises, mid-term tests (colloquia).					
Syllabus per week outline	<ol style="list-style-type: none"> 1. Introduction to Alumina Technology; 2. Basic raw materials for obtaining alumina; 3. Bauxite types, deposits and characteristics; 4. Bauxite characterization (X-Ray and TG-DTA); 5. Physico-chemical properties of aluminium oxide and hydroxide; 6. Properties of aluminate solutions; 7. Bayer cycle in the Na₂O-Al₂O₃-H₂O system; Calculations in the Na₂O-Al₂O₃-H₂O system; 8. Technology of obtaining alumina according to the Bayer process; 9. Technology of bauxite preparation, storage and crushing; 10. Technology of bauxite leaching; 11. Dilution of autoclave pulp, separation and washing of red mud; 12. Technology of decomposition of aluminate solution; 13. Steaming and caustification technology; 14. Calcination technology; 15. Dry alkaline process for obtaining alumina. Combined processes for obtaining alumina. <p>Mid-term tests are taken after the 8th week and the 15th week. Semester verification is required after the 15th week.</p>					
Obligatory reading						
Author	Title, publisher			Year	Pages	
Vračar, R., Živković, Ž.	Ekstraktivna metalurgija aluminijuma, Naučna knjiga Beograd			1993	1-180	
Živković, Ž.	Zbirka zadataka iz metalurgije lakih metala, Tehnički fakultet Bor			1984	1-72	
Additional reading						

Author	Title, publisher	Year	Pages	
Perušić, M.	Fizičko-hemijski aspekti luženja i kalcinacije aluminijum-hidroksida, Univerzitet u Istočnom Sarajevu, Tehnološki fakultet Zvornik	2008	1-150	
Donaldson, D., Raahauge, B.	Essential readings in light metals – Alumina and bauxite, John Wiley & Sons, New Jersey	2013	1-973	
Obligations, assessment methods and grading system	Type of student evaluation		Grade points	Percentage
	Pre-exam obligations			
	Attendance		6	6 %
	Laboratory exercises		10	10%
	Mid-term test (Colloquium) 1		27	27%
	Mid-term test (Colloquium) 2		27	27%
	Final examination			
	Final examination (oral)		30	30 %
Total		100	100 %	
Web page	www.tfzv.ues.rs.ba			
Date	2023			