
	<b>UNIVERSITY OF EAST SARAJEVO</b> Faculty of Technology Zvornik					
	<i>Study programme: Chemical Engineering and Technology</i>					
	Cycle I	Year IV				
<b>Course title</b>	TECHNOLOGY OF METALLIC MATERIALS					
<b>Department</b>	Department for Chemical Technology – Faculty of Technology Zvornik					
<b>Course code</b>	<b>Course status</b>	<b>Semester</b>	<b>ECTS</b>			
04-2-042-7	Elective	VII	5			
<b>Teacher</b>	Dr Dragica Lazić, Full Professor					
<b>Teaching assistant</b>	Dr Dragana Kešelj, Associate Professor					
<b>Number of classes/ teaching workload (per week)</b>		<b>Individual student workload (in hours per semester)</b>		<b>Student workload coefficient S<sub>0</sub></b>		
<b>Lectures</b>	<b>Auditory exercises</b>	<b>Laboratory exercises</b>	<b>Lectures</b>	<b>Auditory exercises</b>	<b>Laboratory exercises</b>	<b>S<sub>0</sub></b>
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						
<b>Learning outcomes</b>	<p>After finishing the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. demonstrate the necessary theoretical and technological knowledge in the field of iron, copper, zinc, aluminum, and lead metallurgy</li> <li>2. calculate the material and heat balance in the process of obtaining iron, copper, zinc, aluminum, and lead</li> <li>3. practically manage the technological processes of producing metals</li> <li>4. demonstrate the knowledge of the working conditions of the basic stages of producing metals.</li> </ol>					
<b>Prerequisites</b>						
<b>Teaching methods</b>	Lectures, auditory and laboratory exercises, mid-term tests (colloquia).					
<b>Syllabus outline per week</b>	<ol style="list-style-type: none"> <li>1. Metals throughout history; Metals and their properties; Classification;</li> <li>2. Basic processes for obtaining metals;</li> <li>3. Properties and use of iron; Raw materials in iron production; Preparation of raw materials in production of iron;</li> <li>4. Production of iron by pyrometallurgical process; Chemistry of blast furnace processes; Blast furnace gas;</li> <li>5. Slag; Pig iron; Cast iron; Steel production processes; Processing and refining steel products; Environmental protection during iron production;</li> <li>6. Properties and applications of copper; Raw materials for obtaining copper; Procedures for obtaining copper;</li> <li>7. Pyrometallurgical process of obtaining copper; Mechanical preparation of raw materials; Roasting of raw materials; Furnaces for roasting sulphide concentrates; Smelting of copper stone;</li> <li>8. Crude copper refining (flame refining, electrolytic refining); Hydrometallurgical process of obtaining copper;</li> <li>9. Properties and use of lead; Raw materials for obtaining lead; Procedures for obtaining lead;</li> <li>10. Lead refining; Environmental protection during lead production;</li> <li>11. Properties and uses of zinc; Raw materials for obtaining zinc; Hydrometallurgical procedure for zinc production;</li> <li>12. Zinc refining; Environmental protection during zinc production;</li> <li>13. Properties and use of aluminum; Procedures for obtaining alumina;</li> <li>14. Obtaining metallic aluminum by electrolysis of alumina; Environmental protection during aluminum production;</li> <li>15. Secondary production of certain metals.</li> </ol> <p style="text-align: right;">Mid-term tests are taken after the 8th week and the 15th week. Semester verification is required after the 15th week.</p>					

<b>Obligatory reading</b>				
<b>Author</b>	<b>Title, publisher</b>	<b>Year</b>	<b>Pages</b>	
Vračar, R.	Ekstraktivna metalurgija olova, Naučna knjiga, Beograd,	1995	1-206	
Vračar, R.	Ekstraktivna metalurgija cinka, Naučna knjiga, Beograd,	1997	1-205	
Božić, B.	Metalurgija gvožđa, BIGS, Beograd,	1973	1-150	
Vračar, R., Živković, Ž..	Ekstraktivna metalurgija aluminijuma, Naučna knjiga, Beograd,	1993	1-298	
<b>Additional reading</b>				
<b>Author</b>	<b>Title, publisher</b>	<b>Year</b>	<b>Pages</b>	
Vračar, R., Kamberović, Ž., Sinadinović, D., Savović, V., Stopić, S., Cerović, K.	Proračuni u metalurgiji obojenih metala, Bakar-Bor	2000	1-235	
<b>Obligations, assessment methods and grading system</b>	<b>Type of student evaluation</b>		<b>Points</b>	<b>Percentage</b>
	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 %
<b>Web page</b>	www.tfzv.ues.rs.ba			
<b>Date</b>				