	UNIVERSITY OF EAST SARAJEVO Faculty of Technology Zvornik	
	Study programme: *Chemical Engineering and Technology*	
	Cycle I / Academic year IV	

Course title	INORGANIC CHEMICAL TECHNOLOGY II
Department	Department for Chemical Technology– Faculty of Technology Zvornik

Course code	**Course status**	**Semester**	**ECTS**
04-1-058-8	Obligatory	VIII	7

Teacher	Dragica Lazić, PhD, full professor
Teaching assistant	Dragan Kešelj, PhD, associate professor

Number of hours/ teaching workload (per week)			**Individual student workload (in hours per semester)**			**Student workload coefficient S_o**
Lectures	**Auditory exercises**	**Laboratory exercises**	**Lectures**	**Auditory exercises**	**Laboratory exercises**	**S_o**
3	1	2	60	20	40	1,33
3*15+1*15+2*15=90 hours			(3*15*1.33+1*15*1.33+2+15*1.33)=120 hours			
Total course workload 90 + 120=210 hours per semester						

Learning outcomes	After finishing the course, students will: 1. know the fundamentals of technology processes in inorganic chemical technology; 2. be professionally trained in the field of technology processes in inorganic chemical technology 3. know material and and energy balance of these processes; 4. know the ways in which technology processes are monitored (process parameters, laboratory analyses)
Prerequisites	Inorganic chemistry, Physical Chemistry, Technology/Unit Operations
Teaching methods	Lectures, experimental exercises, industrial visists, consultations (tutoring) mid-term tests (colloquia), seminars, tests
Syllabus outline per week	1. Sulfuric acid. Properties of sulfuric acid. Raw materials for the production of sulfuric acid. 2. Obtaining sulfur dioxide gas Recovery of sulfur dioxide from flue gases. Purification of sulfur dioxide gas using an electrostatic filter. 3. Obtaining concentrated sulfur dioxide. Oxidation of sulfur dioxide and production of sulfuric acid. The nitrous method. 4. The contact process. Absorption of sulfur trioxide. Obtaining 100% sulfur trioxide. Improving the process of obtaining sulfuric acid and protecting the environment. 5. Nitric acid. Properties of nitric acid. Production of nitric acid by the contact oxidation of ammonia. Concentration of nitric acid. Direct synthesis of concentrated nitric acid. Environmental protection. 6. Hydrogen chloride and hydrochloric acid. Basic physicochemical properties of hydrocloric acid. Production of hydrogen chloride. Cooling and absorption of hydrogen chloride. Environmental protection. 7. Phosphoric acid. Physicochemical properties of phosphoric acid. Thermal process of obtaining phosphoric acid. Production of phosphoric acid by decomposition of phosphates with sulfuric acid. Environmental protection. 8. Technology of inorganic salts. Classification of inorganic salts. 9. Artificial fertilizers. Classification of artificial fertilizers. Simple nitrogen fertilizers (ammonium sulfate, ammonium nitrate, carbamide(urea), calcium cyanamide, calcium nitrate, ammonium chloride, sodium nitrate, ammonium sulfonitrate) 10. Phosphorus fertilizers. Natural phosphorus fertilizers (guano, bone meal, phosphorite). Artificial phosphorus fertilizers (superphosphate, double superphosphate). Potassium fertilizers. Complex and compound fertilizers. Fertilizers obtained by dissolving phosphate with nitrogen acid. Environmental protection in the production of artificial fertilizers. 11. Inorganic pigments. Origin of color in inorganic pigments. Application of inorganic pigments. Classification of inorganic pigments. Production of inorganic pigments. Testing the quality of produced pigments. 12. Aluminum. Raw materials in aluminum production. The Bayer process. Production of aluminum by electrolysis of alumina from molten cryolite. Properties and use of aluminum. 13. Iron. Properties and use of iron. Production of iron by pyrometallurgical process. Processes for

	obtaining steel (Bessemer process, Thomas process, Siemens-Martin process, electric procedure) 14. Zinc. Properties and uses of zinc. Production of zinc by pyrometallurgical process.Zinc smelting. Reduction of zinc oxide. Refining and distillation of zinc. 15. Lead. Properties and uses of lead. Production of lead by pyrometallurgical process. Lead smelting. Reduction of lead oxide. Refining. Tests are envisaged after the 8th week and the 15th week.

Obligatory reading

Author	Title, publisher	Year	Pages
Kostić-Gvozdenović Lj., Ninković R.	Neorganska hemijska tehnologija, Univezitet u Beogradu, Tehnološko-metalurški fakultet	1997	241-385
Lazić, D., Penavin-Škundrić J., Vasiljević, Lj.	Materijalni i energetski bilans neorganskih baza i soli, Univerzitet u Istočnom Sarajevu, Tehnološki fakultet Zvornik,	2007	208-344
Lazić, D., Penavin-Škundrić J., Sladojević, S.Vasiljević, Lj.	Materijalni i energetski bilans neorganskih kiselina, Univerzitet u Istočnom Sarajevu, Tehnološki fakultet Zvornik,	2010	1-353

Additional reading

Author	Title, publisher	Year	Pages
Ninković, R.,Todorović, M., Miladinović, J., Radovanović, D.	Teorijski osnovi neorganskke hemijske tehnologije, Univezitet u Beogradu, Tehnološko-metalurški fakultet Beograd	2003	1-401
Ivić, S.	Anorganska kemijska tehnologija, Univerzitet u Sarajevu	1968	1-718
Tecilazić-Stevanović, M.	Osnovi tehnologije keramike, TMF Beograd,	1990	1-413

	Type of student evaluation	Grade points	Percentage
Obligations, assessment methods and grading system	Pre-exam obligations		
	Attendance	6	6 %
	Mid-term test I and II (problem solving)	24	24 %
	Mid-term test (laboratory exercises)	10	10 %
	Test (I+II)	30	30 %
	Final examination (oral)	30	30 %
	Total	100	100 %
Web page	www.tfzv.ues.rs.ba		
Date	2023		