

		UNIVERSITY OF EAST SARAJEVO					
		Faculty of Technology Zvornik					
		Study programme: Chemical Engineering and Technology					
		Cycle I		Year IV			
Course title		TECHNOLOGY OF NATURAL POLYMERS					
Department		Department for Chemical Technologies– Faculty of Technology Zvornik					
Course code		Course status		Semester		ECTS	
04-2-066-8		Elective		VIII		4	
Teacher		Zoran Petrović, PhD, Assoc. Prof.					
Teaching assistant		Zoran Petrović, PhD, Assoc. Prof.					
Number of classes/ teaching workload (per week)			Individual student workload (in hours per semester)			Student workload coefficient S ₀	
Lectures	Auditory exercises	Laboratory exercises	Lectures	Auditory exercises	Laboratory exercises	S ₀	
2	0	2	30	0	30	1.00	
2*15+0*15+2*15=60 hours			(2*15*1+0*15*1+2*15*1)=60 hours				
Total course workload 60 + 60 = 60 hours per semester							
Learning outcomes		<p>After finishing the course, students will be able to:</p> <ol style="list-style-type: none"> 1. demonstrate and consolidate knowledge and understanding of the origin, division of natural polymers, their structure, physical and chemical properties. 2. demonstrate and utilize knowledge about the extraction of natural polymers from natural resources and ways of their modification. 3. understand the relationships between the structure and properties of natural polymers. 					
Prerequisites							
Teaching methods		Lectures, auditory exercises, experimental exercises, industrial visits.					
Syllabus outline per week		<ol style="list-style-type: none"> 1. Basic facts about polymers and polymeric materials (composition and structure of natural polymers, importance of renewable sources of raw materials, biological cycle of natural polymers). 2. Classification of natural polymers (biopolymers) (functions of biopolymers, molecular and supramolecular structure of natural polymers). 3. Polysaccharides (classification and structure of polysaccharides). 4. Structure and properties of cellulose (molecular and supramolecular structure of cellulose, crystalline modifications of cellulose, physico-chemical properties of cellulose, application of cellulose). 5. Cellulose derivatives (regenerated cellulose, microcrystalline cellulose, cellulose ethers, cellulose esters, cellulose natural and cellulose fibers). 6. Structure of lignin, properties and application. 7. Structure, properties and application of starch (starch polysaccharides, primary structure, properties and separation of starch fractions, starch extraction procedures from starch raw materials, starch-based products). 8. Polysaccharides of animal origin (chitin, chitosan, glycosaminoglycan, extraction procedures and application). 9. Structure and properties of proteins (structure, method of formation of protein classifications, conformation of polypeptide chains, fibrous proteins). 10. Structure, properties and application of keratin (structure of keratin fibers, mechanical and physiological properties of keratin fibers, application of keratin). 11. Structure, properties and application of collagen (structure, characteristics, primary and supramolecular structure, elastin, primary structure fibroin and sericin, conformation (supermolecular structure of fibrin). 12. Structure, properties and application of casein (structure, phase transformation, application). 13. Protein fibers (structure and properties of silk and wool) 14. Natural rubber, structure and application (structure, natural rubber derivatives, production process, purification, application) 15. Natural resins (types, methods of extraction, purification, application). 					
Obligatory reading							
Author		Title, publisher			Year	Pages	
Petrović, S., Mijin, D.,		Hemija prirodnih organskih jedinjenja, Tehnološko-			2009		

Stojanović, N.	metalurški fakultet Beograd			
Andričić, B.	Priradni polimerni materijali, priručnik, Sveučilište u Splitu, Split	2008		
Petrović, Z., Dugić, P. Aleksić, V.	Fizičko-hemijska ispitivanja u procesima organske industrije, Univerzitet u Istočnom Sarajevu, Tehnološki fakultet Zvornik, Zvornik	2011		
Additional reading				
Author	Title, publisher	Year	Pages	
Stojanović, N. i saradnici	Hemija prirodnih organskih jedinjenja - belančevine, Tehnološko-metalurški fakultet Beograd	1991		
Jovanović, R.	Celulozna prirodna i hemijska vlakna, Građevinska knjiga, Beograd	1989		
Rogovin, M.	Технология целулозе и её производство, Наука, Москва	1999		
Obligations, assessment methods and grading system	Type of student evaluation		Grade points	Percentage
	Pre-exam obligations			
		Attendance	6	6 %
		Mid-term test (Colloquium) 1	27	27 %
		Mid-term test (Colloquium) 2	27	27 %
		Laboratory exercises	10	10 %
	Final examination			
		Final examination (oral)	30	30 %
	Total	100	100 %	
Web page	www.tfzv.ues.rs.ba			
Date	2023			