
		UNIVERSITY OF EAST SARAJEVO						
		Faculty of Technology Zvornik						
		Study program: Chemical Engineering and Technology						
		First cycle studies		Year IV				
Course title		BIOCHEMICAL ENGINEERING						
Department		Department for Process Engineering						
Course code		Course status		Semester		ECTS		
4.7.3. PT		Mandatory		VII		6		
Teacher		Vladan Mičić, PhD, full professor						
Teaching assistant		Duško Kostić, MSc, teaching assistant						
Class fund/ teaching load (weekly)			Individual student workload (hours per semester)			Student load factor S_o		
Lectures	Auditory Exercises	Laboratory Exercises	Lectures	Auditory Exercises	Laboratory Exercises	S_o		
3	2	0	45	30	0	1		
total teaching load (in hours, per semester) $3*15 + 2*15 + 0*15 = 75$			total student workload (in hours, per semester) $3*15*1 + 2*15*1 + 0*15*1 = 75$					
Total course load (teaching + student): $75+ 75 =150$ semester hours								
Learning outcomes		After finishing the course, students will be able to: Demonstrate and utilize fundamental knowledge and abilities in the field of biochemical engineering theory, and understanding of individual stages of bioprocesses and their mutual connections.						
Prerequisites		-						
Teaching methods		Lectures, auditory exercises, industrial visits						
Course content by week		I Lectures 1. Introduction. Biological basis of biochemical engineering. Biocatalysts. Application of biotechnology. 2. Stoichiometry of bioprocesses. 3. Kinetics of microbial processes. Conceptualizing a mathematical model of a biological process. Kinetics of simple enzymatic reactions without inhibition. 4. Kinetics of simple enzymatic reactions with inhibition. Irreversible and reversible inhibition. 5. Graphic representation of kinetic models of enzymatic reactions. 6. Integrated forms of kinetic models of enzymatic reactions. 7. Knowledge test (Mid-term test/Colloquium 1) 8. Kinetics of microbial processes in ideal bioreactors, ideal batch bioreactor. 9. Flow bioreactor, mass balance in an ideal flow bioreactor, productivity of an ideal stirred flow bioreactor. Flow bioreactor with recirculation. Multistage flow reactor. 10. Thermodynamics of bioprocesses. 11. Bioreactors. Bioreactors for submerged cultivation of microorganisms. Enzyme bioreactors. 12. Mass transfer in bioreactors. 13. Development of bioprocesses. Increasing the scale of bioprocesses. 14. Knowledge test (Mid-term test/Colloquium 2) 15. Final exam						
Mandatory literature								
Author		Title of publication, publisher			Year	Pages (From-To)		
Siniša Popov		<i>Osnovi biohemijskog inženjerstva-Teorija i praksa</i>			2000			
Vlada Veljković		<i>Osnovi biohemijskog inženjerstva</i>			1994			
J.E. Bailey, D.F. Ollis		<i>Biochemical engineering fundamentals</i>			1977			
H. Schwartzberg, M. Rao		<i>Biotechnology and Food Process Engineering</i>			1990			
H.B. Lee		<i>Fundamentals of Food Biotechnology</i>			1996			
Ljiljana Mojović		<i>Biohemijsko inženjerstvo</i>			2006			
Vladimir Marić, Božidar Šantek		<i>Biokemijsko inženjerstvo</i>			2009			
Supplementary Literature								
Author		Title of publication, publisher			Year	Pages (From-To)		

M. Stojanović, M. Nikšić	Opšta mikrobiologija	2000	
Obligations, forms of knowledge testing and assessment	Type of student work evaluation	Points	Percentage
	Pre-exam obligations		
	Attendance at lectures/exercises	6	6 %
	Mid-term test/Colloquium 1	32	32 %
	Mid-term test/Colloquium 2	32	32 %
	Final exam		
	Final exam	30	30 %
Total	100	100 %	
Date of certification	2023		