	UNIVERSITY OF EAST SARAJEVO Faculty of Technology Zvornik	
	Study program: Chemical Engineering and Technology	
	CYCLE I / YEAR II	

Course title	MASS AND ENERGY TRANSPORT PHENOMENA
Department	Department for Process Engineering-Faculty of Technology Zvornik

Course code	**Course status**	**Semester**	**ECTS**
	Obligatory	III	7

Teacher	Mitar Perusic, PhD, full professor
Teaching assistant	Dusko Kostic, MSc, teaching assistant

Hours number (weekly)			**Individual work (hours per semester)**			**Student's work coefficient, S_o**
Lectures	**Auditory exercises**	**Laboratory Exercises**	**Lectures**	**Auditory exercises**	**Laboratory Exercises**	**S_o**
3	3	0	45	45	0	1.50
3*15 + 3*15 + 0*15 = 90			3*15*1.40 +3*15*1.40 + 0*15*1.40 = 130			
Total course workload (hours per semester, teacher + student): 90+ 130 = 220						

Learning outcomes	After finishing the course, students will be able to: 1. find and use literature data needed to analyse mass and energy transfer; 2. recognize and distinguish between mass and energy transfer phenomena; 3. mathematically analyse the phenomena of mass and energy transfer; 4. recognize the influence of certain parameters on the speed of mass and energy transfer; 5. analyse, solve, present solutions of tasks and compare the results of mass and energy transfer, and recognize the application and importance of heat transfer in practice.
Prerequisites	None.
Teaching methods	Lectures, class exercises and individual work
Syllabus outline per week	1. Introduction to the course. The concept of energy. Thermodynamic aspects and aspects of the phenomenon of mass and energy transfer. 2. The concept of working media. The concept and types of fluids. 3. Fluid flow. Laminar and turbulent flow. Boundary layer. 4. The main mechanisms of heat transfer. Units and dimensions of heat transfer. The concept of temperature field. 5. Heat conduction). Analysis of heat conduction. Heat conduction through a flat wall and other geometric shapes. 6. Stationary heat conduction. 7. Non-stationary heat conduction. Mid-term test/Colloquium 1. 8. Heat transfer by flow (convection). Analysis of convective heat transfer. 9. Forced convection. 10. Natural convection. 11. Heat transfer by condensation and boiling. 12. Heat exchangers. Types of heat exchangers. Analysis of the efficiency of the heat exchanger. 13. Heat transfer by radiation. I'm thinking of waves. Heat exchange by radiation. 14. Mass transfer. Fitch's law of diffusion. 15. The concept of energy efficiency. Analysis of chapters on the phenomenon of mass and energy transfer (presentation of the seminar paper). Mid-term test/Colloquium 2.

Obligatory literature

Author/s	**Title, publisher**	**Year**	**Page**
M. Perušić, R. Filipović,	Fundamentals of heat transfer-derived theory with solved examples, Faculty of Technology, Zvornik	2014	1-159

Additional reading

Author/s	**Title, publisher**	**Year**	**Page**
S.D. Cvijovic, N.M. Boskovic-Vragolovic	Transport Phenomena, TMF Beograd	2001	1-350
R. B. Bird, W. E. Stewart, E. N. Lightfoot	Transport phenomena, J. Wiley, New York	1960	1-780
J. H. Lienhard IV, J. H.Lienhard	A Heat Transfer Textbook, 4th edition	2016	1-745

V			
J.R. Welty, E. E. Wicks, R. E. Wilson, G. L. Rorrer	Fundamental od Momentum, Heat and Mass Transfer, J.Willey & Sons Inc., New York, 5th edition	2016	1-703

	Type of student evaluation	Grade points	Percentage
Obligations, assessment methods and grading system	Pre-exam obligation		
	Attendance	6	6 %
	Mid-term test I	25	25 %
	Mid-term test II	25	25 %
	Seminar paper	14	14 %
	Final exam		
	Final exam	30	30 %
	TOTAL	100	100 %
Web page	www.tfzv.ues.rs.ba		
Date	2023		