	UNIVERSITY OF EAST SARAJEVO Production and Management Faculty Trebinje	
	Study programme: Industrial Energy Engineering	
	First cycle / Third year	

Course name	HEAT AND MASS TRANSFER
Department	Department of Thermal Power and Process Engineering - Faculty of Mechanical Engineering, East Sarajevo

Course code	**Course status**	**Semester**	**ECTS**
EH-23-1-089-5	Required	V	6

Lecturer(s)	Budimirka Marinović, Assistant professor
Assistant(s)	Milica Kašiković, Teaching assistant

Lectures (theory and application/lab.) (weekly)			**Student workload (hours/per semester)**			**Coefficient of student workload S_o**
T	**App.**	**Lab.**	**T**	**App.**	**Lab.**	**S_o**
3	2	0	3*15*1,4 = 63	2*15*1,4 = 42	0*15*1,4 = 0	1,4

lectures – total (hours per semester) 3*15 + 2*15 + 0*15 = 75	student workload – total (hours per semester) 3*15*1,4 + 2*15*1,4 + 0*15*1,4 = 105

Total (Lectures + Student workload): 75 + 105 = 180 hours/per semestar

Learning outcomes	By mastering this course the student will be able to: 1. apply different forms of energy equation to solve heat transfer problems; 2. calculate the amount of heat and determine the temperature at the passage of heat through surfaces of the appropriate shape in stady-state and non-stady-state conditions. 3. Calculate of the heat exchanged in case when fluid flows through the pipelines. 4. determine the basic parameters of the heat exchanger: inlet and outlet temperatures, flow rates and surfaces.
Prerequisites	No condition
Teaching methods	Lectures, homework, assignments.
Course description (per week)	1. Introduction: physical mechanisms which underline heat and mass transfer model. 2. Introduction to Conduction: temperature gradient, the heat flux, Fourier"s low, thermal conductivity, Temperature distribution, Boundary and Initial Conditions. 3. One-Dimensional Stady-state Conduction with no heat generation.The Plane wall. The Cylinder. 4. Conduction with thermal energy generation: the plane wall, cylindrical wall. 5. Transient conduction: Lumped method 6. Introduction to convection. The convection boundary layers. 7. Local and average convection coefficients. Dimensionless similarity parameters. 8. The flat plate in parallel flow. Convection heat and mass transfer. 9. Internal flow: laminar and turbulent flow in circular tube. 10. External flow: laminar and turbulent flow over an isothermal plate, the cylinder in cross flow, the sphere. 11. Heat exchangers: the parallel flow and conterflow heat exchanger. Heat transfer coefficient. 12. Heat exchangers: Log mean temeperature difference; NTU method 13. Free convection. Physical considerations. Laminar free convection on a vertical surface. 14. Boiling and Condensation. Laminar film condensation on a vertical plate. 15. Radiation: fundamental concepts. Planck low, Wien"s displaceent law, The Stefan-Boltzmanon low.

Required learning material

Author(s)	**Publication title, publisher**	**Year**	**Pages (from-to)**
Incropera & Dewitt	Fundamentals of Heat and Mass Transfer,	2002.	

Suggested learning material

Author(s)	**Publication title, publisher**	**Year**	**Pages (from-to)**

Assessment activities and final grade	**Assessment**	**Credits**	**Percentage**
	Pre-exam activities		
	Homework	10	10 %
	First preliminary examination	20	20 %
	Second preliminary examination	20	20 %
	Final exam		
	Final exam	50	50 %

	TOTAL	100	100 %
Web page	http://fpmtrebinje.com/wp/wp-content/uploads/2016/11/1_EH_Prenos_toplote_i_mase.pdf		