

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/3
Branch	REFRIGERATION AND AIR CONDITIONING		Semester	IV	
Course Code	404	Course Name	Basics of Heat Transfer		
Course Outcome 1	Explain Basic Concepts of Heat Transfer			Teaching Hrs	Marks
Learning Outcome 1	Describe heat transfer process and its importance in Industries.			5	10
Contents	Study of Heat, Energy, work, First law and second law of thermodynamics. Definition of heat transfer and its importance in process Industries.				
Method of Assessment	Theory Exam (Part of External)				
Learning Outcome 2	Elaborates Various Modes Of Heat Transfer			7	10
Contents	Basic definitions of heat transfer through Conduction, Convection and Radiation, thermal conductivity and effect of temperature on thermal conductivity of different solids, liquids and gases.				
Method of Assessment	WrittenTest (Part of Progressive test1) (Part of Internal)				
Course Outcome 2	Calculate Rate of Heat Transfer in Solids Through Conduction			Teaching Hrs	Marks
Learning Outcome 1	Explain the Fourier's Law of Heat Conduction			7	10
Contents	Fourier's law of heat conduction with Concepts of Heat transfer rate, Heat flux, Temperature gradient, thermal resistance, thermal conductivity				
Method of Assessment	Theory Exam (Part of External)				
Learning Outcome 2	Calculate The Overall Heat Transfer Coefficient for Different Materials Using Fourier's Law			7	10
Contents	One dimensional steady heat transfers through Conduction in plane walls, composite walls or slabs, Hollow Cylinders or tubes, Critical radius of insulation for pipes and Electrical analogy. Overall heat transfer coefficient U_{th} .				
Method of Assessment	Theory Exam (Part of External)				
Learning Outcome 3	To Determine Thermal Conductivity of Given Metal Rod.			15	15
Contents	Fourier's law of heat conduction with Concepts of Heat transfer rate, Heat flux, Temperature gradient, thermal resistance, thermal conductivity				
Method of Assessment	Laboratory Test by Observation (Part of Lab Work) (Part of External)				

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 2/3
Branch	REFRIGERATION AND AIR CONDITIONING		Semester	IV
Course Code	404	Course Name	Basics of Heat Transfer	
Course Outcome 3	Calculate Rate of Heat Transfer for Given Process Through Convection			Teaching Hrs Marks
Learning Outcome 1	Explain Newton's Law of Heat Transfer Through Convection			7 10
Contents	Definition of Convection heat transfer phenomenon, Free Convection and Forced Convection (definitions only), Newton's Law of Heat Transfer, convective heat transfer coefficient, Individual and Overall heat transfer coefficient			
Method of Assessment	Term Work (Internal)			
Learning Outcome 2	Solve Simple Numerical Problem Related To Newton's Law Of Heat Transfer.			7 10
Contents	Newton's Law of convective heat transfer, Individual and Overall heat transfer coefficient .			
Method of Assessment	Theory Exam (Part of External)			
Learning Outcome 3	To Determine Heat Transfer Co-Efficient in Convection.			12 15
Contents	Definition of Convection heat transfer phenomenon, Free Convection and Forced Convection (definitions only), Newton's Law of Heat Transfer, convective heat transfer coefficient,			
Method of Assessment	Laboratory Test by Observation (Part of Lab Work) (Part of External)			
Course Outcome 4	Calculate Rate Of Heat Transfer Through Radiation.			Teaching Hrs Marks
Learning Outcome 1	Define Basic Terms Related to Radiation			5 10
Contents	Concepts of radiation, Emission of radiation Wavelength of radiation , Emissive power, Black body, Gray body ,White body Opaque body			
Method of Assessment	Theory Exam (Part of External)			
Learning Outcome 2	Explain Various Laws of Radiations			8 10
Contents	Absorptivity, reflectivity and transmissivity, black, white and grey body, emissive power, emissivity, Kirchhoff's law, Planck's law, Wien's displacement law, Stefan-Boltzmann law, intensity of radiation.			
Method of Assessment	Written test (Part of Progressive Test 2) (Part of Internal)			
Learning Outcome 3	Solve Simple Problems Related to Heat Transfer Through Radiation.			6 10
Contents	Intensity of radiation, radiation heat exchange between black bodies, shape factor, electrical analogy, radiation heat exchange between gray bodies, radiosity, irradiation, radiation shields.			
Method of Assessment	Theory Exam (Part of External)			

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 3/3	
Branch	Refrigeration and Air-conditioning		Semester	IV	
Course Code	404	Course Name	BASICS OF HEAT TRANSFER		
Course Outcome 5	Analyze Heat Exchangers			Teaching Hrs	Marks
Learning Outcome 1	Explain Different Types of Heat Exchangers.			5	10
Contents	Types of heat exchanger based on flow pattern, function and construction ,Double pipe heat exchanger Counter flow, Parallel flow , Shell and tube heat exchanger 1-1 Pass , 1-2 Pass				
Method of Assessment	Seminar presentation (Part of Internal)				
Learning Outcome 2	Derive Equation and Calculate L.M.T.D.			7	10
Contents	L.M.T.D. derivation of equation Overall heat transfer co-efficient of heat exchangers and heat exchanger area				
Method of Assessment	Laboratory work (Part of Internal)				
Learning Outcome 3	Solve Simple Numerical Problems on Heat Exchangers			7	10
Contents	LMTD of Parallel flow and Counter flow heat exchangers, Overall heat transfer coefficient, No. of transfer Units(NTU)				
Method of Assessment	Theory Exam (Part of External)				