MERI College of Engineering and Technology
(MERI - CET)

Lesson Plan

Name of the Faculty : Mr. Pardeep

Discipline : Mechanical Engineering

Semester : 6th

Subject : Heat Transfer (**PCC-ME -306G)**

Lesson Plan Duration : 15 Weeks (from May. 2021 to Aug. 2021)

** Work Load (Lecture) per week (in hours): Lectures-03, Practicals-01

Week	Theory		Practical	
	Lecture Day	Topic (including assignment/test)	Practical day	Topic
1st	1st	Basics and Laws: Definition of Heat Transfer, Reversible and irreversible processes	1st	To determine the thermal conductivity of a metallic rod.
	2nd	Modes of heat flow		
	3rd	Combined heat transfer system and law of energy conservation		
2nd	4th	Steady State Heat Conduction: Introduction, I-D heat conduction through a plane wall	2nd	To determine the thermal conductivity of an insulating power.
	5th	Steady State Heat Conduction in long hollow cylinder		
	6th	Steady State Heat Conduction in hollow sphere		
3rd	7th	Conduction equation in Cartesian Co-ordinates.	3rd	To determine the thermal conductivity of an insulating power.
	8th	Conduction equation in Polar Co-ordinates.		
	9th	Conduction equation in Spherical Co-ordinates.		

4th	10th	Steady State Conduction with Heat Generation: Introduction	4th	To find the effectiveness of a pin fin in a rectangular duct natural convective condition and plot temperature distribution along its length.
	11th	1 – D heat conduction with heat sources		
	12th	Extended surfaces (fins), Fin effectiveness		
5th	13th	2-D heat conduction, Numericals	5th	To find the effectiveness of a pin fin in a rectangular duct under forced convective and plot temperature distribution along its length.
	14th	Transient Heat Conduction: Systems with negligible internal resistance		
	15th	Transient heat conduction in plane walls		
6th	16th	Transient heat conduction in cylinders, spheres with convective boundary conditions	6th	To determine the surface heat transfer coefficient for a heated vertical tube under natural convection and plot the variation of local heat transfer coefficient along the length of the tube. Also compare the results with those of the correlation.
	17th	Chart solution		
	18th	Relaxation Method, Numericals.		
7th	19th	Convection: Forced convection-Thermal and hydro-dynamic boundary layers	7th	To determine average heat transfer coefficient for a externally heated horizontal pipe under forced convection & plot Reynolds and Nusselt numbers along the length of pipe. Also compare the results with those of the correlations.
	20th	Equation of continuity, Momentum and energy equations		

	21st	Some results for flow over a flat plate and flow through tube		
8th	22nd	Fluid friction and heat transfer (Colburn analogy)	8th	To measure the emmisivity of the gray body (plate) at different temperature and plot the variation of emmisivity with surface temperature.
	23rd	free convection from a vertical flat plate		
	24th	Empirical relations for free convection from vertical and horizontal o\planes & cylinders, Numericals		
9th	25th	Thermal Radiation: The Stephen-Boltzmann law, The black body radiation	9th	To find overall heat transfer coefficient and effectiveness of a heat exchange under parallel and counter flow conditions. Also plot the temperature distribution in both the cases along the length of heat of heat exchanger.
	26th	Shape factors and their relationships, Heat exchange between nonblack bodies		
	27th	Electrical network for radiative exchange in an enclosure of two or three gray bodies, Radiation shields, Numericals		
10th	28th	Heat Exchangers: Classification, Performance variables	10th	To verify the Stefen-Boltzmann constant for thermal radiation
	29th	Analysis of a parallel/counter flow heat exchanger		
	30th	Heat exchanger effectiveness, Numericals.		
11th	31th	Winglets, Types of Winglets, Heat Transfer Augmentation Process	11th	Revision
	32nd	Effect of heat treatment augmentation		
	33rd	Application of heat treatment augmentation process		

12th	34th	Heat transfer augmentation in a channel flow.	12th	Revision
	35th	Heat Transfer with Change of Phase: Laminar film condensation on a vertical plate	13th	
	36th	Drop-wise condensation, Boiling regimes, Free convective		
13th	37th	Nucleate and film boiling, Numericals	14th	Revision
	38th	Revision		
	39th	Revision		
14th	40th	Revision		Revision
	41st	Revision		
	42nd	Revision		
15th	43rd	Revision		Revision
	44th	Revision		
	45th	Revision		