

PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Mechanical Engineering

Faculty Name: - Rajinder Kumar
Year/Semester: 3rd/5th

Subject Name: - Heat Transfer
Subject Code: - MEC- 301 A

LESSON PLAN

Sr. No.	Lecture No.	Topics To Be Covered	Tentative Date	Mode of Delivery
1	L1	Unit -1 Definition of heat: Mode of heat transfer	01/10/21	PPT
2	L2	Basic laws of heat transfer, electrical analogy of heat conduction	05/10/21	Marker & Board
3	L3	Conduction through composite walls, overall heat transfer coefficient	07/10/21	Marker & Board
4	L4	The general conduction equation in Cartesian coordinates	08/10/21	Marker & Board
5	L5	The general conduction equation in cylindrical coordinates	12/10/21	Marker & Board
6	L6	The general conduction equation in spherical coordinates	14/10/21	Marker & Board
7	L7	The plane slab, The cylindrical shell, The spherical shell	19/10/21	Marker & Board
8	L8	Critical thickness of insulation	21/10/21	Marker & Board
9	L9	Variable thermal conductivity	22/10/21	Marker & Board
10	L10	Steady one dimensional heat conduction with uniform internal heat generation the plane slab	26/10/21	Marker & Board
11	L11	Cylindrical and spherical systems	28/10/21	Marker & Board

12	L12	Unsteady heat conduction: lumped parameter analysis, introduction to Heisler charts.	29/10/21	Marker & Board
13	L13	Governing equation for fins of uniform cross section, temperature distribution	02/11/21	Marker & Board
14	L14	Heat dissipation rate in infinitely long fin	09/11/21	Marker & Board
15	L15	Fin insulated at tip, fin losing heat at tip	16/11/21	Marker & Board
16	L16	Efficiency and effectiveness of fins	18/11/21	Marker & Board
17	L17	Unit-2 Newton's law of cooling, convective heat transfer, Dimensionless numbers, Reynolds, Prandtl, Nusselt, Grashoff, Stanton	19/11/21	Marker & Board
18	L18	Significance of dimensionless number	23/11/21	Marker & Board
19	L19	Dimensionless analysis of free and forced convection	25/11/21	Marker & Board
20	L20	Analytical solution to forced convection problems	26/11/21	Marker & Board
21	L21	The concept of boundary layer, hydrodynamic & thermal boundary layer	30/11/21	Marker & Board
22	L22	Momentum & energy equation for boundary, Exact solution for laminar flow	02/12/21	Marker & Board
23	L23	The integral approach, integral momentum and energy equations, solution of forced convection over a flat plate using the internal method	03/12/21	Marker & Board
24	L24	Relationship between fluid friction and heat transfer, Reynolds analogy Introduction to empirical method of solution, flow over a flat plate with both conditions of constant heat flux and constant temperature, cylinder in cross flow, flow over a sphere	07/12/21	Marker & Board
25	L25	Introduction to velocity profile, pressure gradient and friction factor in fully developed flow, mean	10/12/21	Marker &

		temperature, energy balance considering constant surface heat flux and for constant surface temperature		Board
26	L26	convection correlations for laminar flow in circular tubes both in entry region and in the fully developed region	14/12/21	Marker & Board
27	L27	Physical considerations, governing equations (without derivations), functional form of the solution of governing equations	21/12/21	Marker & Board
28	L28	Empirical correlations for external free convection flow over the vertical plate, horizontal and inclined plates, horizontal cylinder and sphere	23/12/21	Marker & Board
29	L29	Unit-3 Fundamental concepts, absorption, reflection and transmission, black body concept, monochromatic and total emissive power	24/12/21	PPT
30	L30	Planck's distribution law, Stefan Boltzman law, Wien's displacement law,	28/12/21	PPT
31	L31	Kirchoff's law, intensity of radiation, Lambert's cosine law	30/12/21	PPT
32	L32	heat transfer between black surfaces, Radiation shape factor	31/12/21	Marker & Board
33	L33	Heat transfer between non-black surfaces: infinite parallel planes, Infinite long concentric cylinders	04/01/22	Marker & Board
34	L34	Small gray bodies and small body in large enclosure	06/01/22	Marker & Board
35	L35	Electrical network approach, radiation shields.	07/01/22	Marker & Board
36	L36	Unit-4 Classification of heat exchanger, Overall heat transfer coefficient	11/01/22	PPT
37	L37	Logarithmic mean temperature difference	13/01/22	Marker & Board
38	L38	Limitations of LMTD Approach	14/01/22	PPT
39	L39	Effectiveness of heat exchangers	18/01/22	Marker & Board

40	L40	NTU method of heat exchanger design	20/01/22	Marker & Board
41	L41	Applications of heat exchangers	21/01/22	PPT

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