Lesson Plan

PCC-ME-501-21

HEAT AND MASS TRANSFER

B. Tech (Mechanical Engineering) V Semester

S. No.	Topic	Lecture Number
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2	Derivation of heat balance equation- Steady state one dimensional solution for conduction, heat transfer in Cartesian	2
3	Derivation of heat balance equation- Steady state one dimensional solution for conduction, heat transfer in cylindrical	3
4	Derivation of heat balance equation- Steady state one dimensional solution for conduction, heat transfer in spherical geometry	4
5	critical insulation thickness	5
6	lumped system approximation	6
7	Biot number	7
8	heat transfer through extended surfaces	8
9	One-dimensional conduction solutions for unsteady state heat transfer-approximate solution by the use of Heissler charts	9
10	Heat convection, basic equations such as continuity equation and momentum equation	10
11	Introduction to boundary layer, laminar and turbulent flow, external and internal flows (flow over flat plate and circular pipes)	11
12	Natural convective heat transfer	12
13	Dimensionless parameters for forced and free convection heat transfer	13
14	Correlations for forced and free convection- Approximate solutions to laminar boundary layer equations (momentum and energy) for both internal and external flow	14
15	Estimating heat transfer rates in laminar flow situations using appropriate correlations for free convection (flat plate and circular pipes)	15
16	Estimating heat transfer rates in laminar flow situations using appropriate correlations for forced convection (flat plate and circular pipes)	16

17	Interaction of radiation with materials, definitions of radiative properties	17
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21	Kirchhoff's law	21
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