

LESSON PLAN FOR ACADEMIC SESSION: 2025-26 (WINTER)

Discipline: Metallurgical Engineering	Semester : 5th	Name of the Teaching Faculty : Amarjit Mohanta
Subject : HEAT TRANSFER, FLUID FLOW & FURNACES	No. of days / week class allotted	Semester From : 15/07/2025 to 15/11/2025 Nos. of Weeks per semester : 15
Week	Class Day	Theory Topics
1 ST	1 st	Discuss types of fluids (ideal and real)
	2 nd	Discuss types of fluids (ideal and real)
	3 rd	Discuss types of fluids (ideal and real)
	4 th	Discuss types of fluids (ideal and real)
2 ND	1 st	Discuss the type of flow (stream line & turbulent).
	2 nd	Discuss the type of flow (stream line & turbulent).
	3 rd	Discuss the type of flow (stream line & turbulent).
	4 th	State and explain Bernoulli's equation.
3 RD	1 st	State and explain Bernoulli's equation.
	2 nd	State and explain Bernoulli's equation.
	3 rd	Discuss the flow through orifices, Pitot tube and venturies
	4 th	Discuss the flow through orifices, Pitot tube and venturies
4 TH	1 st	Discuss the flow through orifices, Pitot tube and venturies
	2 nd	Define and calculate loss of head (friction loss) in straight pipes, in bends and channel with sudden enlargement and sudden contraction.
	3 rd	Define and calculate loss of head (friction loss) in straight pipes, in bends and channel with sudden enlargement and sudden contraction.
	4 th	Define and calculate loss of head (friction loss) in straight pipes, in bends and channel with sudden enlargement and sudden contraction.
5 TH	1 st	Discuss the elementary idea on different modes of heat transfer.
	2 nd	Define and derive the Fourier's law.
	3 rd	Define and derive the Fourier's law.
	4 th	Explain & calculate the steady state heat conduction through flat walls.
6 TH	1 st	Explain & calculate the steady state heat conduction through flat walls.

	2 nd	Define Convection.
	3 rd	Define and differentiate between natural and forced convection
	4 th	Define and differentiate between natural and forced convection
	1 st	Define and differentiate between natural and forced convection
7 TH	2 nd	State the natural and forced heat transfer co-efficient (equation only, no derivation).
	3 rd	State the natural and forced heat transfer co-efficient (equation only, no derivation).
	4 th	Define radiations
	1 st	State the Stefan Boltzmann's Law
8 TH	2 nd	State the Stefan Boltzmann's Law
	3 rd	Define emissivity of black bodies and grey bodies.
	4 th	Define emissivity of black bodies and grey bodies.
	1 st	Classify the furnaces based on use, heat source and material movements.
9 TH	2 nd	Classify the furnaces based on use, heat source and material movements.
	3 rd	Classify the furnaces based on use, heat source and material movements.
	4 th	Soaking pits
	1 st	Reheating furnace
10 TH	2 nd	Heat treatment furnace
	3 rd	Melting
	4 th	Smelting
	1 st	Refining furnaces
11 TH	2 nd	Revision
	3 rd	State the principles of heat generation in electric furnaces such as arc, resistance and induction (core less)
	4 th	State the principles of heat generation in electric furnaces such as arc, resistance and induction (core less)
	1 st	State the principles of heat generation in electric furnaces such as arc, resistance and induction (core less)
12 th	2 nd	Class Test
	3 rd	Revision

	4 th	Discuss on heat losses
13 th	1 st	Discuss on heat losses
	2 nd	heat balance
	3 rd	heat balance
	4 th	furnace efficiency
14 th	1 st	furnace efficiency
	2 nd	Explain the types of " waste heat recovery system
	3 rd	Explain the types of " waste heat recovery system
	4 th	Regenerators
15 th	1 st	Regenerators
	2 nd	Recuperates
	3 rd	Recuperates
	4 th	Revision

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12/09/25
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