Lesson Plan

Subject: Physical Metallurgy (TH-2) Name of faculty:

Semester: 4TH Class allotted: 5p/week Branch: METALLURGY Session:2025(S)

Discipline	Semester	From date: To date:	Teaching Aid
Subject:	No of days/per week	Theory/Practical–Topics/Lesson	
Week	Date/Period		
1	04/02/2025 TO 08/02/2025	**Crystal Structure of metals** : Define crystal and crystallography Define space lattice and unit cell Compare different types of crystal lattices, bravis lattices and primitive lattices. Define with sketch B.C.C., F.C.C & H.C.P.	White Board Marker Smart board
2	10/02/2025 TO 15/02/2025	Define Miller indices, planes and directions Define isotropy and anisotropy in metallic materials Define imperfections in metallic materials Differentiate between types of imperfections : point defect, line defect, surface defect and volume defect (elementary idea)	White Board Marker Smart board
3	17/02/2025 TO 22/02/2025	2.**Solidification of pure metals & alloys** Define alloys and solid solution Define solidification and crystallization Explain role of free energy thermodynamic potential in conversion of liquid to solid	White Board Marker Smart board
4	24/02/2025 TO 01/03/2025	Define super cooling, under cooling, degree of super cooling Explain mechanism of solidification/ crystallization, nucleation, critical size nucleus, spontaneous nucleation, relation between ration of nucleation and grain growth. Discuss shape of crystals and solidification of ingot .	White Board Marker Smart board

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Week	Date/Period	Theory/Practical–Topics/Lesson	Teaching Aid
5	03/03/2025 TO 08/03/2025	3. **Equilibrium Diagram** Define equilibrium diagram Discuss the importance of equilibrium diagram Draw equilibrium diagram of binary alloys State types of equilibrium diagram	White Board Marker Smart board
6	01/03/2025 TO 15/03/2025	Explain isomorphous equilibrium diagram with examples Explain eutectic type and eutectoid equilibrium diagram with example Explain peritectic type and peritectoid equilibrium diagram with example	White Board Marker Smart board
7	17/03/2025 TO 22/03/2025	Define phase rule, lever rule Apply phase rule, and lever rule in each equilibrium diagram. Draw iron carbon equilibrium diagram and describe different phases and micro constituent in iron carbon diagram	Marker White Board
8	24/03/2025 TO 29/03/2025	Discuss role of carbon with iron to differentiate steel and cast iron Apply lever rule in iron and carbon diagram Differentiate between iron-carbon, iron-cementite, and iron-graphite diagram	White Board Marker Smart board
9	31/03/2025 TO 05/04/2025	4. **Solid solution** : Define solution, alloying Explain different types of solid solution	White Board Marker Smart board
10	07/04/2025 TO 12/04/2025	Differentiate between substitutional and interstitial solid solution, chemical compound, mechanical mixture and intermetallic compounds. Differentiate between ordered and disordered solid solution	Marker White Board Smart board
11	14/04/2025 TO 19/04/2025	Define Hume Rothery rule and describe the different factors governing the formation of solid solutions 5. **Cast iron** : Define cast iron, differentiate between steel and cast iron, alloy steel and alloy cast iron.	White Board Marker Smart board
12	21/04/2025 to 26/04/2025	Discuss different types of cast iron with their composition	Marker White Board Smart board

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13.	28/04/2025 TO 03/05/2025	Define graphitization and role of graphitization in cast iron	White Board Marker Smart board
14	05/05/2025 TO 10/05/2025	Draw structures of cast iron 6. **Metallurgical Microscope** : Differentiate between metallurgical microscope & biological microscope Describe different types of metallurgical microscope	White Board Marker Smart board
15	12/05/2025 TO 17/05/2025	State working principle of metallurgical microscope Define magnifying power & resolving power, spherical and chromatic aberration. Explain with sketch principle of electron microscope Prepare a sample for study of microstructures e.g. sampling, cutting, grinding, rough polishing, intermediate polishing, fine polishing and etching	White Board Marker smart Board

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