

Lesson Plan

Subject: Physical Metallurgy

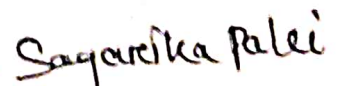
Name of faculty: Sagarika Palei

Semester: 4th Class allotted: 4p/week Branch: METALLURGICAL Session: 2024(S)

Discipline	Semester	From date:	To date:	Teaching Aid
Subject:	No. of days/per week	Theory/Practical-Topics/Lesson		
Week	Date/Period			
1	16/01/2024	1.0 Crystal Structure of metals : 1.1 Define crystal and crystallography 1.2 Define space lattice and unit cell 1.3 Compare different types of crystal lattices, bravis lattices and primitive lattices. 1.4 Define with sketch B.C.C., F.C.C & H.C.P.		WhiteBoard Marker Smart board
	TO 20/01/2024			
2	22/01/2024	1.5 Define Miller indices, planes and directions 1.6 Define isotropy and anisotropy in metallic materials 1.7 Define imperfections in metallic materials 1.8 Differentiate between types of imperfections : point defect, line defect, surface defect and volume defect (elementary idea)		WhiteBoard Marker Smart board
	TO 27/01/2024			
3	29/01/2024	2.0 Solidification of pure metals & alloys 2.1 Define alloys and solid solution 2.2 Define solidification and crystallization 2.3 Explain role of free energy thermodynamic potential in conversion of liquid to solid		WhiteBoard Marker Smart board
	TO 03/02/2024			
4	05/02/2024	2.4 Define super cooling, under cooling, degree of super cooling 2.5 Explain mechanism of solidification/ crystallization, nucleation, critical size nucleus, spontaneous nucleation, relation between ration of nucleation and grain growth. 2.6 Discuss shape of crystals and solidification of ingot .		WhiteBoard Marker Smart board
	TO 10/02/2024			



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Week	Date/Period	Theory/Practical–Topics/Lesson	Teaching Aid
5	12/02/2024 TO 17/02/2024	3.0 Equilibrium Diagram 3.1 Define equilibrium diagram 3.2 Discuss the importance of equilibrium diagram 3.3 Draw equilibrium diagram of binary alloys 3.4 State types of equilibrium diagram	WhiteBoard Marker Smartboard
6	19/02/2024 TO 24/02/2024	3.5 Explain isomorphous equilibrium diagram with examples 3.6 Explain eutectic type and eutectoid equilibrium diagram with example 3.7 Explain peritectic type and peritectoid equilibrium diagram with example	WhiteBoard Marker Smartboard
7	26/02/2024 TO 02/03/2024	3.8 Define phase rule, lever rule 3.9 Apply phase rule, and lever rule in each equilibrium diagram. 3.10 Draw iron carbon equilibrium diagram and describe different phases and micro constituent in iron carbon diagram	Marker WhiteBoard
8	04/03/2024 TO 09/03/2024	3.11 Discuss role of carbon with iron to differentiate steel and cast iron 3.12 Apply lever rule in iron and carbon diagram 3.13 Differentiate between iron-carbon, iron-cementite, and iron-graphite diagram	WhiteBoard Marker Smartboard
9	11/03/2024 TO 16/03/2024	4.0 Solid solution : 4.1 Define solution, alloying 4.2 Explain different types of solid solution	WhiteBoard Marker Smartboard
10	18/03/2024 TO 23/03/2024	4.3 Differentiate between substitutional and interstitial solid solution, chemical compound, mechanical mixture and intermetallic compounds. 4.4 Differentiate between ordered and disordered solid solution	Marker WhiteBoard Smartboard
11	27/03/2024 TO 30/03/2024	4.5 Define Hume Rothery rule and describe the different factors governing the formation of solid solutions 5.0 Cast iron : 5.1 Define cast iron, differentiate between steel and cast iron, alloy steel and alloy cast iron.	WhiteBoard Marker Smartboard
12	02/04/2024	5.2 Discuss different types of cast iron with their composition	Marker WhiteBoard Smartboard

	To 06/04/2024	IA	
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13.	08/04/2024 To 13/04/2024	5.3 Define graphitization and role of graphitization in cast iron	White Board Marker Smart board
14.	15/04/2024 To 20/04/2024	5.4 Draw structures of cast iron 6.0 Metallurgical Microscope : 6.1 Differentiate between metallurgical microscope & biological microscope 6.2 Describe different types of metallurgical microscope	White Board Marker Smart board
15	22/04/2024 TO 26/04/2024	6.3 State working principle of metallurgical microscope 6.4 Define magnifying power & resolving power, spherical and chromatic aberration. 6.5 Explain with sketch principle of electron microscope 6.6 Prepare a sample for study of microstructures e.g. sampling, cutting, grinding, rough polishing, intermediate polishing, fine polishing and etching	White Board Marker smart Bord


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