LESSON PLAN				
Discipline: Metallurgical Engineering			Semester: 4th Semester	Name of the Teaching Faculty: Ms. Sitanjali Khuntia
Subject: Physical Metallurgy Sub code: (Th:2)			No of days /week class allotted:03	Semester from Date: 22.12.2025-18.04.2026 No of weeks: 20
Month	week	No of periods available	Class Day	Theory topics
Dec	4th	3P	22-12-2025	Classification of materials: Metals, alloys
			23-12-2025	Classification of materials: Ceramics, polymers, composites
			24-12-2025	Structure of metals: Atomic bonding, metallic bonding
	5th	3P	29-12-2025	Imperfections in Solids: Point defects: Vacancies, interstitials defects
			30-12-2025	substitutional defects, Line defects:
			31-12-2025	Edge and screw dislocations,
Jan	2nd	3P	05-01-2026	Surface defects: Grain boundaries, twin boundaries
			06-01-2026	volume defects
			07-01-2026	Solid solutions (substitutional, interstitial),
	3rd	2P	12-01-2026	Hume-Rothery rules, intermediate phases,
			13-01-2026	Solidification of pure metals & alloys
	4th	3P	19-01-2026	Alloys and solid solution
			20-01-2026	solidification and crystallization,
			21-01-2026	role of free energy thermodynamic potential in conversion of liquid to solid, super cooling, under cooling, degree of super cooling,
	5th	2P	27-01-2026	Class test
			28-01-2026	mechanism of solidification/ crystallization, nucleation, critical size nucleus,
Feb	1st	3P	02-02-2026	spontaneous nucleation, relation between nucleation and grain growth,
			03-02-2026	shape of crystals and solidification of ingot.
			04-02-2026	Definitions of phase, component, degree of freedom,
	2nd	3P	09-02-2026	the phase rule and its applications
			10-02-2026	Unary Phase Diagrams
			11-02-2026	Pressure-temperature diagrams for pure substances.
	3rd	3P	16-02-2026	Interpretation of binary phase diagrams (eutectic, peritectic)
			17-02-2026	Internal Assessment
			18-02-2026	Internal Assessment
	4th	3P	22-02-2026	Binary Pase diagram: Lever rule,
			23-02-2026	Equilibrium and non-equilibrium cooling.
			24-02-2026	Iron carbon diagram

Mar	1st	1P	02-03-2026	Concept of Ferrous Alloys: Different steels
	2nd	3P	09-03-2026	Plain Carbon Steels: Classification based on carbon content, Properties and applications.
			10-03-2026	Class test
			11-03-2026	Alloy Steels: Effects of alloying elements (Ni, Cr, Mo, V, W, Mn, Si) on properties,
	3rd	4P	16-03-2026	classification of alloy steels, applications, stainless and special steels
			17-03-2026	Cast Irons: Types of cast irons (grey, white, ductile, malleable),
			18-03-2026	Cast Irons: Microstructure, properties, and applications.
	4th	3P	23-03-2026	Internal Assessment
			24-03-2026	Internal Assessment
			25-03-2026	Concept of Non-Ferrous Alloys: Aluminum Alloys: Common aluminum alloys, their properties, and applications
	5th	2P	30-03-2026	Copper Alloys: cupronickel, their properties, and applications.
			31-03-2026	Other Non-Ferrous Alloys:
April	2nd	3P	06-04-2026	Brief overview of titanium alloys, nickel alloys, etc
			07-04-2026	Superalloys, classification, properties and applications
			08-04-2026	Shape memory alloys, , classification, properties and applications
	3rd	4P	13-04-2026	Doubt Clearing
			15-04-2026	Doubt Clearing

22.12.25

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