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: **05**	Semester from Date: **14/02/2023 to 23/05/2023** No of weeks: **16**

Month	Week	No of periods available	Class Day	Theory topics
Feb	1st	04P	14-02-2023	Structure of metals: Types of bonds
			15-02-2023	Explain crystals and crystallography
			16-02-2023	Defining space lattice and unit cells
			17-02-2023	Comparing different types of crystal lattice andprimitive cell
	2nd	05P	20-02-2023	Defining SC, BCC, FCC & HCP
			21-02-2023	Define miller indices of a plane
			22-02-2023	Miller indices of a direction
			23-02-2023	Isotropy and anisotropy in metallic material
			24-02-2023	Imperfection in metallic material
	3rd	02P	27-02-2023	Differentiation between types of imperfection point
			28-02-2023	Crystal defect, line defect surface
Mar	4th	03P	01-03-2023	Defects and volume defects
			02-03-2023	Defects of metal
			03-03-2023	Define alloys and solid solution
	5th	03P	06-03-2023	Define solidification and crystallization
			09-03-2023	Explain role of free energy thermodynamic potential in conversion of liquid to solid
			10-03-2023	Define super cooling, under cooling, Degree of super cooling
	6th	05P	13-03-2023	Explain mechanism of solidification
			14-03-2023	Explain mechanism of crystallization, nucleation,critical size nucleus
			15-03-2023	Spontaneous nucleation, relation between ration of nucleation and grain growth
			16-03-2023	Discuss shape of crystals and solidification of ingot
			17-03-2023	Discuss shape of crystals and solidification of ingot
	7th	05P	20-03-2023	Define equilibrium diagram
			21-03-2023	Discuss the importance of equilibrium diagram
			22-03-2023	Draw equilibrium diagram of binary alloys
			23-03-2023	State types of equilibrium diagram
			24-03-2023	Explain isomorphous diagram with examples
	8th	O4P	27-03-2023	Explain eutectic type equilibrium diagram with examples
			28-03-2023	Explain the eutectoid equilibrium diagram
			29-03-2023	Explain the eutectoid equilibrium diagram with example
			31-03-2023	Explain peritectic types and peritectoid equilibrium diagram with example

	9th	04P	03-04-2023	Explain peritectic types and peritectoid equilibriumdiagram with example
			04-04-2023	Define phase rule, lever rule and applying phaserule and lever rule in each equilibrium diagrams
			05-04-2023	Appling phase rule and lever rule in each equilibrium diagrams
			06-04-2023	Draw iron carbon equilibrium diagram and Describe different phases and micro constituents in ironcarbon diagram
	10th	04P	10-04-2023	Discuss iron carbon equilibrium phase diagram
			11-04-2023	Discuss iron carbon equilibrium phase diagram
			12-04-2023	Iron carbon phase diagram
			13-04-2023	Practice of drawing iron carbon phase diagram
April	11th	05P	17-04-2023	Apply lever rule in iron carbon diagram
			18-04-2023	Iron graphite diagram
			19-04-2023	Discuss carbon in iron to differentiate steel and cast iron
			20-04-2023	Apply lever rule in iron carbon diagram
			21-04-2023	Differentiate between iron carbon on iron cementite, and iron graphite diagram
	12th	05p	24-04-2023	Solid solution: Define solution, alloying
			25-04-2023	Explain different types of solid solution
			26-04-2023	Explain different types of solid solution
			27-04-2023	Differentiate between substitutional and interstitial solid solution, chemical compound
			28-04-2023	Mechanical mixture and intermetallic compounds
	13th	05P	01-05-2023	Define ordered and disordered solid solution Differentiate between ordered and disordered solidsolution
			02-05-2023	Describe the different factors governing the formationof solid solution
			03-05-2023	Hume rothery rule for primary substitutional solid solution
			04-05-2023	Intermediate phases: interstitial compound, electron compound, defect phase, electro valency compound
	14th	05P	08-05-2023	Define cast iron, differentiate between steel and cast iron
May			09-05-2023	Discussion between diff types of cast iron with their composition,
			10-05-2023	factors affecting formation of gray or whitecast iron
			11-05-2023	Define graphitization and role of graphitization in cast iron
			12-05-2023	Discussion of metallurgical microscope
	15th	04P	15-05-2023	Differentiate between metallurgical and biological microscope
			16-05-2023	Describe different types of metallurgical microscope. State working principles of metallurgical microscope
			17-05-2023	Define magnifying power and resolving power, spherical, and chromatic aberration

			18-05-2023	Explain with sketch principle of electron microscope
	16th	02P	22-05-2023	Sample preparation and study the microstructure through microscope (metallography)
			23-05-2023	Previous year question practice

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