DISPLINE- METALLURGY

Name of the teacher- Sadashiba Patra

Semester-4th -Session-2023-24

From-16/01/2024 to 26/04/2024

Subject-Theory-2(Physical Metallurgy)

Wk no	Day	Units to be convert	Remark
WK-1 16/01/24 to 20/01/2024	Day-1	Introduction to Metallurgy & Physical Metallurgy	
	Day-2	Broad idea regarding solids, liquids, gases & crystals.	
	Day-3	Crystals & Crystallography	
	Day-4	Space lattice & unit cell	
WK-2 22/01 to 27/01/2024	Day-1	Types of crystal lattices, Bravis lattice & primitive cell.	
	Day-2	Define with sketch, BCC, FCC & CPH structure.	
	Day-3	Study of various parameters like packing factor, co-ordination no, effective no of atoms per unit cell.	
WK-3 29/1/2024 to 03/02/2024	Day-1	Miller indics of planes & directions.	
	Day-2	Isotropy & Anisotropy in metallic materials.	
	Day-3	Review & test on chapters covered till date.	
	Day-4	Introduction to imperfections in metallic crystals & type.	
	Day-5	Study of various types of point defects.	
WK-4 05/02/2024 to 10/02/2024	Day-1	Study of various types of line defects.	
	Day-2	Study of volume and surface defects.	
	Day-3	Definition of alloys and solid solutions.	
	Day-4	Solidification & crystallisation .	
	Day-5	Role of free energy/ thermodynamic potential in conversion of liquid to solid.	
WK-5 12/02/2024 to 17/02/2024	Day-1	Super cooling, under cooling & degree of super cooling.	
	Day-2	Mechanism of solidification.	
	Day-3	Nucleation, critical size of nucleaous.	
	Day-4	Spontaneous(Homogeneous & Heterogeneous nucleation) Relation between rate of nucleation and crystal growth.	
WK-6 19/02/2024 To 24/02/2024	Day-1	Ingot structure & shape of crystals.	
	Day-2	Review of chapter-2	
	Day-3	Test on chapter-2	

	Day-4	Introduction to equilibrium diagram, definition & difference from phase diagram/importance of phase diagram.	
	Day-5	Drawing of equilibrium diagram of binary systems.	
WK-7 26/02/2024 To 02/03/2024	Day-1	Types of Equilibrium diagram.	
	Day-2	Explanation of isomorphous type of equilibrium diagram with example.	
	Day-3	Peritectic & peritectoid type of equilibrium diagrams.	
	Day-4	Phase rule & lever Rule. Application of phase rule & lever rule.	
	Day-5	Introduction to Fe-Fe_3c phase diagram.	
WK-8 04/03/2024 To 09/03/2024	Day-1	Drawing of Fe-Fe3c phase diagram.	
	Day-2	Practice of drawing Fe-Fe3c phase diagram.	
	Day-3	Different phases, microconstituent of Fe-Fe3c system.	
	Day-4	Role of carbon in iron to differentiate steel & cast iron.	
	Day-5	Application of Lever rule to Fe-Fe3c system.	
WK-9 11/03/2024 TO 16/03/2024	Day-1	Difference between Fe-Fe3c & Fe-c diagram.	
	Day-2	Review of equilibrium diagram.	
	Day-3	Class test on equilibrium diagram.	
	Day-4	Class test on Fe-Fe_3c diagram.	
	Day-5	Introduction solution, solid solution & alloys.	
WK-10 18/03/2024 TO 23/03/2024	Day-1	Study of various types of solid solutions.	
	Day-2	Difference between solid solution, chemical compound, mechanical mixture, intermediate compound.	
	Day-3	Various intermediate compounds, difference between ordered & disordered solid solutions, super lattices.	
	Day-4	Hume Ruthery's Rule and factors governing formation of solid solution.	
	Day-5	Class test on solid solution.	
WK-11 25/03/2024 TO 30/03/2024	Day-1	Introduction to cast iron, Difference between steel & C.T, Alloy steel & alloy cast iron.	
	Day-2	Types of cast iron & properties.	
WK-12 01/04/2024 TO 06/04/2024	Day-1	I.A. Tast	
WK-13 08/04/2024 TO 13/04/2024	Day-1	Review of I.A test questions & microstructure of different cast irons.	
	Day-2	Review of cast iron.	
	Day-3	Introduction to metallurgical microscope, its difference from biological microscope.	

	Day-4	Working principle of optical. Metallurgical microscope.	
WK-14 15/04/2024 TO 20/04/2024	Day-1	Working principle of electron microscope and comparison between the electron & optical metallurgical microscope.	
	Day-2	Study of magnifying power & resolving powder.	
	Day-3	Spherical & chromatic aberration.	
	Day-4	Sample preparation for metallographic study(Sample cutting, grinding, Rough polishing intermediate polishing, fine polishing.	
WK-15 22/04/2024 TO 27/04/2024	Day-1	Review of metallurgical microscope .	
	Day-2	class test on metallurgical microscope.	
	Day-3	Review of previous year question.	
	Day-4	Very similar test.	
	Day-5	Very similar test	

16/01/24