

GOVERNMENT POLYTECHNIC JAJPUR

A/ P. Ragadi, Block: Korei, Dist: Jajpur, Odisha - 755019

Website: <https://www.gpjajpur.org> E-mail: [principals@pjajpur@yahoo.co.in](mailto:principals@pjajpur@yahoo.co.in) Contact: 9437155107

DEPARTMENT OF METALLURGICAL ENGINEERING

LESSON PLAN

Discipline Metallurgy	Semester 4th	Name of teaching faculty: Hari Shankar Dehuria P.T.G.F in metallurgy
Subject PM	No day/ week class: 4	No of week: 16 Session: summer 2022
Week	Class Day	Topic
1st	1st	INTRODUCTION OF PHYSICAL METALLURGY.
	2nd	BASIC Definition, with Example.
	3rd	Definition of Crystal Structure of Metals
	4th	Crystal, Crystallography, Crystal Structures, lattice, Space lattice, Crystal lattice.
2nd	1st	Unit cell, Crystal Structure, End centered, Primitive unit cell.
	2nd	No. of atom/unit.
	3rd	Discuss about BCC lattice number of atom/unit cell.
	4th	For simple cubic, number of atom/unit cell.
3rd	1st	Discuss for HCP no. of atom/unit cell.
	2nd	
	3rd	Coordinate Number.
	4th	Difference between Isotropy & Anisotropy Seven Crystal system (detail Discussion)
4th	1st	
	2nd	Fourteen Bravais lattice.
	3rd	Miller Indices, Miller Indices of Plane
	4th	Miller Indices of Direction.
5th	1st	Imperfection Defects Crystal: Imperfection.
	2nd	Point defects, Vacancies, Interstitials, Impurities, substitutional impurities
	3rd	Electronic defects, Line defects, edge dislocation, Screw dislocation
	4th	Difference between Edge Dislocation & Screw dislocation
6th	1st	Surface Defects, Grain Boundary, Tilted Boundary, Twin Boundary
	2nd	
	3rd	Volume defects.
	4th	Revision Class.
	...	

Week	Day	Topic
7th	1st	Unit Test - 1
	2nd	Notes Update, Copy Content of Notes
	3rd	Home Pub Quiz, Note on Solid Solution
	4th	Home Quiz of date, Crystal Structure of Iron
8th	1st	Relative Velling defects, Intermetallic Compound
	2nd	Mechanism of Diffusion
	3rd	Solidification of Pure Metals & Alloy
	4th	Roll of Free Energy, Convexity of Equilibrium in Solid, Derivative full details.
9th	1st	
	2nd	Surface Cooling, Mechanism of Solidification
	3rd	Nucleation, Growth, Critical size nucleus
	4th	Copy Corrosion, Notes checking, Revision, Group Discussion
10th	1st	
	2nd	Shape of Crystal & Solidification of Ingot full details of chilled zone, columnar zone, equiaxed zone, explain with full example
	3rd	
	4th	
11th	1st	Equilibrium Diagram, Phase rule
	2nd	Stiles, Degree of Freedom
	3rd	Binary Phase Diagram
	4th	Cooling Curve of Pure Metal & Alloy
12th	1st	Pure Metal
	2nd	Cooling Curve of Alloy
	3rd	The compound completely completely
	4th	Soluble in liquid state & completely in soluble in liquid state (Discuss)
13th	1st	
	2nd	Discuss about microstructure at diff. Temp
	3rd	Application of Lever Rule
	4th	App. Sublim. Line discuss full details.
14th	1st	Peritectic Diagram, Reaction Equation
	2nd	Eutectoid Reaction, Eutectoid Structure
	3rd	Microstructure of D.C.P. & D.F.F.C
	4th	Question & Answer, Numerical discuss a Phase Rule
15th	1st	Peritectoid
	2nd	Iron-Carbon & Equilibrium Diagram
	3rd	Iron-Carbon Equilibrium Constituents, Application of Lever Rule & Numerical Discuss

16th	4th	Titanium (various) - Capillary tubes, Dingzer
	1st	Cast Iron full details, tubes, Steels - Types, Alloy C.T., All on Steels
	2nd	Metallurgical Microscope, Construction, Application
	3rd	Flackow Microscope, full details
	4th	Recession, Carb test, Dumb Clear Cam.