


GOVT. POLYTECHNIC MAYURBHANJ


LESSON PLAN OF PHYSICAL METALLURGY ACADEMIC YEAR (2025-26) SUMMER

Discipline: Metallurgy Engineering	Semester: 4th semester	Name of the Teaching Faculty: ROHIT KUMAR ROUT
Subject: PHYSICAL METALLURGY Sub code: MTPC204	No of days /week class allotted: 03	Semester from Date: 22/12/2025 to 18/04/2026

Mon th	Week	Day	Unit	Topics
December	4 th	1 ST	UNIT-1	Introduction: Classification of materials: Metals, alloys, ceramics, polymers, composites Structure of metals: Atomic bonding, metallic bonding
		3 RD		Imperfections in Solids: Point defects: Vacancies, interstitials, substitutional defects, Line defects: Edge and screw dislocations,
		4 TH		X-MASS DAY
	5 th	1 ST		Surface defects: Grain boundaries, twin boundaries, and volume defects
		3 RD		REVISION
	January	1 st	4 TH	UNIT-2
2 nd		1 ST		solidification and crystallization, role of free energy thermodynamic potential in conversion of liquid to solid,
		3 RD		super cooling, under cooling, degree of super cooling,
		4 TH		mechanism of solidification/ crystallization, nucleation, critical size nucleus,
3 rd		1 ST		spontaneous nucleation, relation between nucleation and grain growth, shape of crystals and solidification of ingot.
		3 RD		MAKAR SANKRANTI
		4 TH		REVISION
4 th		1 ST	UNIT -3	Phase Rule: Definitions of phase, component, degree of freedom,
		3 RD		the phase rule and its applications.
		4 TH		Unary Phase Diagrams
	5 th	1 ST		REPUBLIC DAY

		3 RD		REVISION
		4 TH		1 ST Monthly Test
February	1 st	1 ST	UNIT-3	Pressure-temperature diagrams for pure substances.
		3 RD		Binary Phase Diagrams
		4 TH		Interpretation of binary phase diagrams
		1 ST		eutectic, peritectic, eutectoid, peritectoid
	2 nd	3 RD		lever rule
		4 TH		1 ST MENTORING SESSION
		1 ST		equilibrium and non-equilibrium cooling.
	3 rd	3 RD		Doubt clearing Class
		4 TH		Iron carbon diagram
		1 ST		TECHNICAL SEMINAR BY EXPERT-1
	4 th	3 RD		DISCUSSIN ABOUT METAL & ALLOY
		4 th		Alloys and Their Properties
March	1 st	1 ST	UNIT-4	Ferrous Alloys
		3 RD		Plain Carbon Steels: Classification based on carbon content, properties and applications of ferrous alloys
		4 th		Alloy Steels: Effects of alloying elements (Ni, Cr, Mo,)
	2 nd	1 st		HOLI
		3 rd		Alloy Steels: Effects of alloying elements (V, W, Mn, Si)
		4 th		classification of alloy steels,
	3 rd	1 st		applications, stainless and special steels
		3 rd		
		4 th		Cast Irons: Types of cast irons (grey, white, ductile, malleable),
	4 th	1 ST		TECHNICAL SEMINAR BY EXPERT-2
		3 RD		their microstructure, properties, and applications
		4 TH		Non-Ferrous Alloys:
	5 th	1 ST		Aluminum Alloys: Common aluminum alloys, their properties, and applications.
		3 RD		SECOND INTERNAL ASSESSMENT-2
		4 TH		SECOND INTERNAL ASSESSMENT-2
	6 TH	1 ST		REVISION
April	1 st	3 RD	UTKAL DIVAS	
		4 TH	REVISION	
	2 nd	1 ST	PRE SEMESTER	
		3 RD	REVISION	
		4 TH	Doubt clearing Class	
	3 rd	1 ST	GROUP DISCUSSION	
		3 RD	REVISION	
		4 TH	2 nd Monthly Test	


26/12/2025
Subject Expert
Metallurgy Engg.


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HOD
METALLURGY ENGINEERING
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