


GOVT. POLYTECHNIC MAYURBHANJ, TIKARPADA


LESSON PLAN OF METALLURGICAL THERMODYNAMICS & KINETICS (MTK)

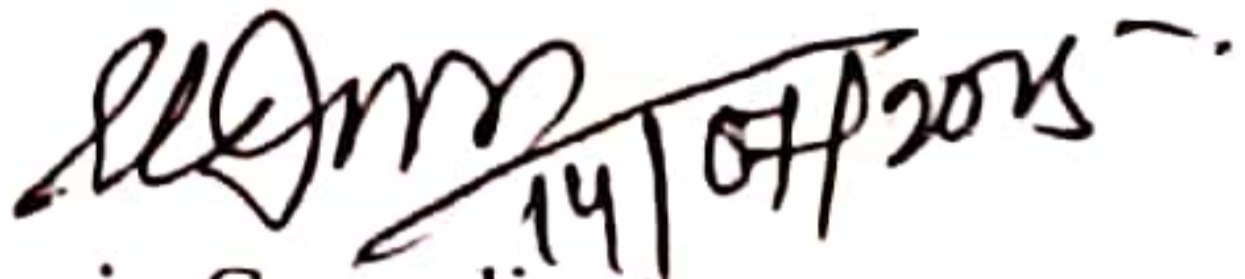
ACADEMIC YEAR (2025-26) WINTER

Program : METALLURGICAL ENGG.		Semester: 3rd Sem		Name of the Teaching Faculty : Sushree Subhashree Das			
COURSE: MTK COURSE CODE: MTPC207		No. of Days / per week class allotted : 03		Semester From date : 14.07.2025 To Date : 15.11.2025			
MONTH	Week	Day	Unit	Topics			
JULY	3rd	1st	UNIT-1	Basic Concepts of Thermodynamics : Introduction: Definition of thermodynamics, system, surroundings			
		3rd		types of systems (open, closed, isolated), state functions			
		5th		Zeroth Law of Thermodynamics: Concept of thermal equilibrium, temperature measurement			
	4th	1st		First Law of Thermodynamics: Conservation of energy, internal energy			
		3rd		Enthalpy, heat and work, heat capacity, specific heat.			
		5th		Applications: Brief idea about various processes isothermal			
	5th	1st		adiabatic, isobaric, isochoric			
		3rd		1st Monthly Test			
	AUGUST	1st		5th	UNIT-2	Second and Third Law of Thermodynamics	
		2nd		1st		Entropy: Concept of entropy, entropy change in reversible and irreversible processes	
3rd			entropy and disorder				
5th			Second Law Statements: Different statements of the second law				
3rd		1st	Gibbs free energy: Definition of Gibbs free energy				
		3rd	Its significance in determining spontaneity of reactions				
		5th	Independence Day/ Janmastami (HOLIDAY)				
4th		1st	Relationship between Gibbs free energy and equilibrium constant				
		3rd	Third Law of Thermodynamics				
		5th	Gibbs free energy (ΔG) & Helmholtz free energy (ΔA), Maxwell relations (No Derivation)				
5th		1st	2nd Monthly Test				
		3rd	GANESH PUJA (HOLIDAY)				
		5th	Phase Equilibria & Metallurgical Applications				
1st		1st	UNIT-3	Solutions & Phase Rule : Ideal & non- ideal solutions			
		3rd		Raoult's Law, Henry's Law			
	5th	Birthday of Prophet Mohammed (HOLIDAY)					
	1st	Phase rule (Gibbs' phase rule)					

SEPTEMBER	2nd	3rd	UNIT-4	Unary & binary phase diagrams, Ellingham Diagrams & Applications
		5th		Concept of Ellingham diagrams
	3rd	1st		Oxide stability & reduction reactions, Predominance Area Diagram
		3rd		Chemical Kinetics & Reaction Rate Theory
		5th		Fundamentals of Reaction Kinetics: Rate of reaction, order & molecularity
	4th	1st		Activation energy & Arrhenius equation
		3rd		Homogeneous vs. Heterogeneous reactions
		5th		1st INTERNAL ASSESMENT
	5th	1st		MAHA SAPTAMI (HOLIDAY)
	OCTOBER	1st		3rd
5th			Revision of Unit 4	
2nd		1st	Previous Questions Discussion	
		3rd	Electrochemical Thermodynamics : Electrochemical cells	
		5th	Nernst equation (Basic Level)	
3rd		1st	Thermodynamics in Metallurgical Processes (Basic level)	
		3rd	Application of Thermodynamics in Extraction & Refining	
		5th	Basics of Ironmaking & Steelmaking thermodynamics	
4th		1st	Roasting, Smelting	
		3rd	Refining processes	
		5th	Basic Concept of activity, & equilibrium constant	
5th		1st	Revision of Unit 5	
		3rd	Doubt claring session	
		5th	2nd INTERNAL ASSESMENT	
NOVEMBER		2nd	1st	Previous Questions Discussion
	3rd		RASA PURNIMA (HOLIDAY)	
	5th		Revision of Unit 1-3	
	3rd	1st	Revision of Unit 4 & 5	
		3rd	Previous Questions Discussion	
		5th	Previous Questions Discussion	


 Course Expert
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 Academic Co-ordinator
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