GOVT. POLYTECHNIC MAYURBHANJ

LESSON PLAN FOR PRINCIPLE OF EXTRACTIVE METALLURGY

SUMMER- 2023-24

Discipline : METALLURGY ENGG.		Semester: 4th		Name of the Teaching Faculty : SATYABRATA GIRI
Subject : Principle of Extractive Metallurgy Course Code: TH3		No. of Days / per week class allotted		Semester From date : 16.01.2024 To Date : 26.04.2024
MONTH	Week	Day	Unit	Topics
JANUARY	3rd	2nd	UNIT-1	**Defination of Metallurgical Terms**
		3rd		Discuss about ores minerals, gangue, flux and slag.
	4th	2nd		Define Matte,Speisss, also metals and alloys
		3rd	UNIT-2	**Principles of Pretreatment of ores for Metal Extraction**
		2nd		Explain about drying
		3rd		Define and Explain calculation
	5th	2nd		Explain Different Agglomeration process like Briquetting, Nodulising
		3rd		Discuss about vaccum extrusion, Sintering and palletizing
		2nd	UNIT-3	**General Methods and Principles of Extraction**
		3rd		Pyrometturgical Processes
FEBRUARY	2nd	4th		Explain Roasting and Different roasting Methods
	3rd	2nd		Explain Ellingham Diagram and Predominance Area Diagram
		3rd		Explain smelting and Different smelting practice like flash smelting and matte smelting
		2nd		Explain Distillation Methods and sublimation
		3rd		Conversion of matte and pig iron
	4th	2nd		Explain Hydrometallurgical process
		3rd		Different Stages of Hydrometallurgical process
		1st		**CLASS TEST 1**
		2nd		**CLASS TEST 1**
		2nd		Flow Diagram of Hydrometallurgical Extraction
		3rd		Explain Leaching and Different Leaching methods
	5th	2nd		Electrometallurgical process
		3rd		Defining Electrolysis, Ionic Conductivity, EMF Series, Faraday's Law of Electrolysis
		2nd		Explain Electrowing and Electrorefining
		3rd	UINT-4	**Basic Approaches to refining**
	6th	2nd		Explain Refining
MARCH	1st	3rd		Discuss about Zone refining and Fire refining
		2nd	UNIT-5	**Principles of Metal Extractions**
		3rd		Principles of Metallurgical Thermodynamics Zeroth law of thermodynamics
	2nd	2nd		Reviewing 1st, 2nd and 3rd Law of Thermodynamics and their application in Metallurgical process
		3rd		Disscussing about the concept of Internal energy
		2nd		Enthalpy, and Entropy also free energy of a chemical reaction
		3rd		State Henry's law and Sivert's law

MARCI	3rd	2nd	UNIT-6	**Principles of Metallurgical Thermodynamics Reaction kinetics**
		3rd		Explain First Order reaction and its significance
		2nd		Explain the application of first order reaction Of Metallurgical processes
		3rd		DRI Plant Operation and Abnormalities
	4th	2nd		**INTERNAL-EXAM**
		3rd		**INTERNAL-EXAM**
		3rd		Shutdown Procedure: Normal Shutdown Schedule for a 500 TDP Kiln.
	5th	2nd		The Start Up process: Heating of the Reactor Refractory
		3rd		Accretion Formation
APRIL	1st	2nd		Key notes on process plant operation.
		3rd		Quality Control in Sponge Iron Plant
		2nd		Sampling: Sponge Iron and the Raw materials
		3rd		Chemical Analysis of Sponge Iron, Iron Ore, Lime Stone/Dolomite and Coal
		2nd		Scheme of Quality Control of input Raw Materials: Reactor Feed Iron Ore, Reactor Feed Coal, Back –Spill Coal, Slinger Coal.
		3rd		Determination of Total Iron (FeT), Ferrous Iron and metallic Fe
	2nd	1st		Fugitive Dust Generation Water Pollution Mitigation Measures .Solid Waste Generation and Disposal
		2nd		**CLASS TEST 2**
		3rd		**CLASS TEST 2**
	3rd	2nd		Different Ferro alloys.General methods of producing Ferro alloys: carbothermic and aluminothermy reductions,
		3rd		Production of individual Ferro alloys: Ferro manganese, Ferro chrome, charge chrome,ferrosilicon Fe -Ti, Fe -W, Fe -Mo and Fe -V

Subject Expert
Metallurgy Engineering

HOD,Metallurgy Engg.
Govt. Polytechnic Mayurbhanj

Accademic Co-ordinator
Govt. Polytechnic Mayurbhanj