PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH

LESSON PLAN

Session-2022-2023

Discipline: Metallurgical Engg. Semester: 4th

Name of the Teaching Faculty: Anadi charan Jena

Subject: PEM No. of Days/per week class allotted 04

Semester From Date : 14-2-2023 To Date : 23.5.2023 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
1st Topic 1	1st	Definitions of Metallurgical terms, Introduction
	2nd	Definitions of ore, mineral
	3rd	Definition of gangue, flux, slag
	4th	Definition of matte, Speiss.
2nd	1st	Define, metals and alloys
Topic 2	2nd	Introduction to pretreatment of ores
	3rd	Explaination drying
	4th	Calcination
3rd	1st	Roasting, principles
	2nd	Agglomeration, principles
	3rd	Briquetting process, mechanism
	4th	Mechanism of nodulising process

Signature of the Faculty

Subject: PEM No. of Days/per week class allotted 04

Semester From Date : 14.2.23 To Date : 23.5.23 No. of Weeks : 16

Week	Class Day	Theory /Practical Topics
4th	1st	principles of vacuum extraction process
	2nd	Sintering process, mechanism
	3rd	mechanism of pelletising process
Topic 3	4th	General methods of extraction
5th	1st	Pyrometallurgical processes
	2nd	comparsan - Pyrometallurgy & Hydrometallurgy
	3rd	Roasting process - types
	4th	various roasting methods - explanation.
6th	1st	Ellingham diagrams of oxides.
	2nd	Predominance area diagram
	3rd	Smelting pratices, flash smelting
	4th	Matte smelting, hearth smelting

Signature of the Faculty

Subject: PEM No. of Days/per week class allotted 04

Semester From Date : 14.2.23 To Date : 23.5.23 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
7th	1st	Distillation process
	2nd	Sublimation process
	3rd	Conversion of matte and Pi's iron.
	4th	Introduction to hydrometallurgy
8th	1st	Advantages of hydrometallurgy, limitations.
	2nd	Stages of hydrometallurgy
	3rd	Stages of hydrometallurgy, explanation
	4th	Flow diagram of hydrometallurgy
9th	1st	Explanation of flow diagram
	2nd	Leaching methods, principles
	3rd	Types of leaching methods
	4th	Bacterial and pressure leaching

Signature of the Faculty

Subject: PEM No. of Days/per week class allotted 04

Semester From Date : 14.2.23 To Date : 23.5.23 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
10th	1st	Introduction to electrometallurgy, Electrolysis.
	2nd	EMf Series, applications
	3rd	Faraday's laws of electrolysis
	4th	Electro winning and electro-refining
11th Topic-4	1st	Basic idea on refining
	2nd	zone refining
	3rd	Fire refining
Topic-5	4th	Principle of metal extraction, Introduction
12th	1st	Principles of Metallurgical Thermodynamics
	2nd	Metallurgical thermodynamics, Zeroth law.
	3rd	1st law of thermodynamics
	4th	2nd law of thermodynamics.

Signature of the Faculty

Subject: PEM No. of Days/per week class allotted 04

Semester From Date : 14.2.23 To Date : 23.5.23 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
13th	1st	3rd law of thermodynamics
	2nd	Concept of internal energy, enthalpy.
	3rd	Entropy and entropy change.
	4th	Free energy of chemical reactions
14th	1st	Henry's law, Sievert's law
Topic-6	2nd	Reaction Kinetics, Introduction
	3rd	Diff. between Thermodynamics & Kinetics
	4th	Order of reactions, examples
15th	1st	1st order reaction, examples
	2nd	Derivation of 1st order reaction
	3rd	Higher order reaction
	4th	Applications of 1st order reactions

Signature of the Faculty