

PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF
ENGINEERING & TECHNOLOGY, BARGARH



LESSON PLAN
Session-2023-2024

Discipline: Metallurgical Engg. Semester: 4th

Subject: PEM

Name of the Teaching Faculty: Anadi Charan Jena


Subject: PEMNo. of Days/per week class allotted : 04Semester From Date : 16-01-2024 To Date : 26-04-2024No. of Weeks : 15

Week	Class Day	Theory / Practical Topics
1st Topic-1	1st	Introduction, Definitions of Metallurgical terms
	2nd	Define ores, minerals
	3rd	Definitions of gangue, flux, slag
	4th	Definitions of Speiss, matte
2nd	1st	Definitions of metals and alloys
Topic-2	2nd	Pre treatment of ores, general
	3rd	Explain drying
	4th	Explain Calcination, process details
3rd	1st	Principles of roasting
	2nd	Discussion of agglomeration
	3rd	Briquetting process
	4th	Nodulising process


Signature of the Faculty

Subject: PEMNo. of Days/per week class allotted : 04Semester From Date : 16-01-2024 To Date : 26-04-2024No. of Weeks : 15

Week	Class Day	Theory / Practical Topics
4th	1st	vacuum extension process
	2nd	Sintering process
	3rd	Pelletizing process
Topic-3	4th	General methods of extraction principles
5th	1st	Pyrometallurgical process
	2nd	Comparison, Pyrometallurgy & hydrometallurgy
	3rd	Roasting process - types
	4th	Various roasting methods
6th	1st	Ellingham diagram of oxides
	2nd	predominance area diagram
	3rd	Smelting practices, flash Smelting
	4th	Matte Smelting, hearth Smelting


 Signature of the Faculty

Subject: PEMNo. of Days/per week class allotted : 04Semester From Date : 16-01-2024 To Date : 26-04-2024No. of Weeks : 15

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

AA

Signature of the Faculty

Subject: PEMNo. of Days/per week class allotted : 04Semester From Date : 16-01-2024 To Date : 26-04-2024No. of Weeks : 15

Week	Class Day	Theory / Practical Topics
10 th	1 st	Introduction to electro metallurgy, Electrolysis
	2 nd	EMF series, applications
	3 rd	Faraday's laws of electrolysis
	4 th	Electrowinning and electrorefining
11 th Topic 4	1 st	Basic idea on refining
	2 nd	Zone refining
	3 rd	Pure refining
Topic 5	4 th	Principles of metal extraction, Introduction
12 th	1 st	Principles of thermodynamics
	2 nd	Metallurgical thermodynamics, Zeroth Law
	3 rd	1 st law of thermodynamics
	4 th	2 nd law of thermodynamics



Signature of the Faculty

Subject: PEMNo. of Days/per week class allotted : 04Semester From Date : 16-01-2024 To Date : 26-04-2024No. of Weeks : 15

Week	Class Day	Theory / Practical Topics
13 th	1st	3 rd Law of thermodynamics
	2nd	concept of internal energy and enthalpy
	3 rd	Entropy and entropy change
	4th	Free energy of a chemical reaction
14 th	1st	Henry's law, Sievert's law
Topic-2	2nd	Introduction to Kinetics
	3 rd	Difference between thermodynamics & kinetics
	4th	order of reactions, examples
15 th	1st	1st order reactions, examples
	2nd	Derivation of 1st order reaction
	3 rd	Higher order reactions
	4th	Applications of 1st order reactions


Signature of the Faculty