

PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF
ENGINEERING & TECHNOLOGY, BARGARH



LESSON PLAN
Session-2024-2025

Semester: 4th Discipline: Metallurgical Engg.


Subject: PEM (TH-3)

Name of the Teaching Faculty: Dr. Sheikh Ahsed Hussaini

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

Semester From Date : 04.02-2025 To Date: 21.02-2025 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
1st Topic	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


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Subject: PEM No. of Days/per week class allotted : 64

Semester From Date : 21.02.2025 To Date: 08.03.2025 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
4 th	1 st	Vacuum extruding Process
	2 nd	Sintering Process
	3 rd	Pelletising Process
Topic-3	4 th	General Methods of extraction Principles
5 th	1 st	Pyrometallurgical Process
	2 nd	Comparison, Pyrometallurgy & hydrometallurgy.
	3 rd	Roasting Process - types
	4 th	Various roasting Methods
6 th	1 st	Ellingham diagram of oxides
	2 nd	Predominance area diagram
	3 rd	Smelting Practices, Flash Smelting
	4 th	Matte Smelting, hearth Smelting

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

Semester From Date : 10.03.2025 To Date: 29.03.2025 No. of Weeks : 15

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

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Subject: P.E.M No. of Days/per week class allotted : 04Semester From Date : 03.04.2025 To Date: 19.04.2025 No. of Weeks : 15


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


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Subject: P E M No. of Days/per week class allotted : 04

Semester From Date : 21.04.2025 To Date: 10.05.2025 No. of Weeks : 15

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


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