

PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF  
ENGINEERING & TECHNOLOGY, BARGARH



LESSON PLAN  
Session-2023-2024

Discipline: Metallurgical Engg. Semester: 5<sup>th</sup>

Subject: NFM

Name of the Teaching Faculty: Anad. Charan Jena

Subject: NFMNo. of Days/per week class allotted 04Semester From Date : 1.08.23 To Date : 30.11.23 No. of Weeks : 16

Week	Class Day	Theory/Practical Topics
1st	1st Topic-1	Non-ferrous minerals & ores
	2nd	Mineral Resources of India
	3rd	Non-ferrous Industries in India
	4th Topic-2	Introduction to metal extraction from oxides.
2nd	1st	Extraction of Aluminium
	2nd	Bayer's process of Alumina production.
	3rd	Flow sheet of Bayer's process
	4th	Factors affecting Bayer's process
3rd	1st Topic-2	Hall-Heroult process
	2nd	Synthesis of cryolite
	3rd	Electrolytic Reduction
	4th	Electrolysis, anode effect.

  
Signature of the Faculty

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Semester From Date: 1-08-23 To Date: 30-11-23 No. of Weeks: 16

Week	Class Day	Theory /Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	Refining of Aluminium
	2 <sup>nd</sup> Topic-2	Concentration of Tin ore
	3 <sup>rd</sup>	Smelting of tin concentrate
	4 <sup>th</sup>	Refining of tin
5 <sup>th</sup>	1 <sup>st</sup>	Refining of tin (contd.)
	2 <sup>nd</sup>	uses and applications of tin
	3 <sup>rd</sup> Topic-3	Roasting of Cu ore
	4 <sup>th</sup>	Smelting of Copper ore,
6 <sup>th</sup>	1 <sup>st</sup>	conversion of copper matte
	2 <sup>nd</sup>	Refining of Copper
	3 <sup>rd</sup>	Refining (contd.), and uses of copper
<del>7<sup>th</sup></del>	4 <sup>th</sup>	Roasting & Smelting of lead ore

  
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Week	Class Day	Theory / Practical Topics
7th	1st	Blast furnace Smelting of lead ore
	2nd	Contd.
	3rd	Refining of Base Bullion
	4th	Uses and applications of lead
8th	1st	Roasting of Zinc ore
	2nd	Hydrometallurgy of zinc ore
	3rd	Zinc extraction by vertical Retort Process
	4th	Refining of Zinc
9th	1st	Process of leaching, electrolysis, uses
	2nd	Smelting of nickel concentrate
	3rd	Nickel ore roasting
	4th	Refining of Nickel & uses

  
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Week	Class Day	Theory /Practical Topics
10 <sup>th</sup>	1 <sup>st</sup> Topic-4	Extraction of metals from halides
	2 <sup>nd</sup>	Extraction of titanium
	3 <sup>rd</sup>	Chlorination and Reduction of titanium
11 <sup>th</sup>	1 <sup>st</sup>	Distillation process
	2 <sup>nd</sup>	Distillation, contd.
	3 <sup>rd</sup>	various process of refining
	4 <sup>th</sup>	Production of titanium sponge
<del>12<sup>th</sup></del> 12 <sup>th</sup>	1 <sup>st</sup>	Hunter & Kroll process
	2 <sup>nd</sup>	uses and applications of titanium
	3 <sup>rd</sup>	uses and applications of titanium
	4 <sup>th</sup>	Introduction to precious metals
		Introduction, properties & uses

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Week	Class Day	Theory / Practical Topics
13 <sup>th</sup>	1 <sup>st</sup>	Extraction of Gold
	2 <sup>nd</sup>	Flowsheet of gold extraction, uses of gold
	3 <sup>rd</sup>	Extraction of Silver, uses of Silver
	4 <sup>th</sup>	Extraction of platinum group metals
14 <sup>th</sup>	1 <sup>st</sup> Topic-6	Production of Secondary metals
	2 <sup>nd</sup>	Recovery of Copper from Scrap
	3 <sup>rd</sup>	Recovery of Lead from Scrap
	4 <sup>th</sup>	Flow sheet of cathode copper extraction
15 <sup>th</sup>	1 <sup>st</sup>	Lead recovery from battery scrap
	2 <sup>nd</sup>	Secondary Zinc Production
	3 <sup>rd</sup>	Recovery of Aluminium from Red mud
	4 <sup>th</sup>	Secondary Tin Production



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