

KIIT POLYTECHNIC, BHUBANESWAR

LESSON PLAN Session (2022-2023)

Discipline : Metallurgy	Semester: 3rd Sem/Winter-2022	Name of the Teaching Faculty: Deepak Kumar Patra Asst. Professor Email ID: deepak_patrafmt@kp.kiit.ac.in
Subject: Ferrous Metallurgy - I (Th-4)	No. Of Days/Week - 4	Start Date: 14/09/2022 End Date: 21/01/2023
Week	Class Day	Theory Topics
1 st	1st	Introduction to Ferrous Metallurgy
	2nd	Introduction to Ferrous Metallurgy
	3rd	Different Raw Materials and their functions
	4th	Different Raw Materials and their functions
2 nd	1st	Deposits of iron ores flux and coal in india with particulars reference to Odisha.
	2nd	Different types of iron ores Composition and characteristics of raw materials.
	3rd	Discussion on possible questionnaire
	4th	Evaluation of iron ores.
3 rd	1st	Metallurgical coal Difference between coal and coke
	2nd	Required properties of coke for making iron
	3rd	Flux and its types Evaluation of Flux (available base & basicity)
	4th	Discussion on possible questionnaire
4 th	1st	Quality of burden (physical & chemical properties)
	2nd	Different types of agglomeration required for burden preparation for blast furnace, Briquetting & Nodulizing
	3rd	Sintering
	4th	Pelletising
5 th	1st	Quiz Test -1
	2nd	Function of coke.
	3rd	Quality requirement of coke.
	4th	Preparation of B.F. fuel in India,Auxiliary fuels.
6 th	1st	Fuel Injection,Factors affecting fuel consumption in blast furnace.
	2nd	Discussion on possible questionnaire

	3rd	Charging methods and process
	4th	Blowing in (Drying, filling)
7 th	1st	Blowing in (Lighting and operating)
	2nd	Banking in
	3rd	Blowing out
	4th	Blowing down
8 th	1st	Tapping, Fanning.
	2nd	Back draughting.
	3rd	Disposal of slags, Slags granulation & their utilization
	4th	Discussion on possible questionnaire
9 th	1st	Blast furnace refractories Stack lining, Hearth lining, Hearth walls, Bosh lining
	2nd	Blast furnace cooling arrangement Shaft coolers, Hearth & bosh coolers
	3rd	Tap holes and top hole drilling machine Cast house, Tuyeres assembly
	4th	Raw materials section Charge hosting appliances, Top charging system Blowers, boilers, pumps
10 th	1st	Gas cleaning plant
	2nd	Blast furnace stoves
	3rd	Discussion on possible questionnaire
	4th	Hanging, Scaffolding
11 th	1st	Slip, Chilled hearth
	2nd	Pillaring, Break out
	3rd	Chocking of gas off take Flooding and coke ejection through tap hole
	4th	Leaking tuyers tap holes and coolers Channeling
12 th	1st	Quiz Test -2
	2nd	Blast furnace profile
	3rd	Thermal, physical and chemical profile, Physical chemistry of blast furnace process
	4th	Reactions in tuyere zone
13 th	1st	Reaction in stack
	2nd	Reaction in bosh
	3rd	Reaction in hearth
	4th	Efficiency of B. F. process, Direct & indirect reduction
14 th	1st	Silicon & sulphur reaction
	2nd	Burden calculation for B/F operation

	3rd	Discussion on possible questionnaire
	4th	Bell less charging, High top pressure operation
15 th	1st	Humidification & oxygen enrichment of blast
	2nd	External disiliconisation.
	3rd	Desulphurization
	4th	Discussion on possible questionnaire

Recommended Books: Blast Furnace Iron Making by A. K. Biswas

Reference Books: Iron Making by Tupkaray R. H

(Deepak Kumar Patra)
Asst.Prof. Meta.