

**GOVERNMENT POLYTECHNIC JAJPUR**  
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DEPARTMENT OF METALLURGY

<b>Discipline: Metallurgy</b>	<b>Semester: 6<sup>TH</sup></b>	<b>Name of the Teaching faculty: P ARADHANA</b>
<b>Subject: iron making</b>	<b>No of Days/Week class allotted: 3</b>	<b>Semester from Date: 22/12/25 To Date: 18/4/26</b> <b>No of weeks: 17</b>
<b>Week</b>	<b>Class Day</b>	<b>Topics</b>
1st	1 <sup>st</sup>	Different routes for iron making ,
	2 <sup>nd</sup>	Raw Materials and their functions
	3 <sup>rd</sup>	Deposits of iron ores flux and coal in India with particular reference to Odisha
2nd	1 <sup>st</sup>	Different types of iron ores, Composition and characteristics of raw materials
	2 <sup>nd</sup>	Evaluation of iron ores, Metallurgical coal, Difference between coal and coke
	3 <sup>rd</sup>	Required properties of coke for making iron, Flux and its types, Evaluation of Flux
3rd	1 <sup>st</sup>	Quality of burden
	2 <sup>nd</sup>	Agglomeration and its type i.e Preparation, Function and Quality requirement of Sinter
	3 <sup>rd</sup>	Preparation, Function and Quality requirement of Sinter
4th	1 <sup>st</sup>	Comparison between Sintering and Pelletising
	2 <sup>nd</sup>	Preparation, Function of coke and Quality requirement of coke
	3 <sup>rd</sup>	Preparation, Function of coke and Quality requirement of coke
5th	1 <sup>st</sup>	Auxiliary fuels
	2 <sup>nd</sup>	Factors affecting fuel consumption in blast furnace
	3 <sup>rd</sup>	Burden calculation for B/F operation
6th	1 <sup>st</sup>	Blast furnace Operation: Blowing in, blowing out, Banking, Tapping,
	2 <sup>nd</sup>	Fanning, Back draughting, Slag granulation & their utilization
	3 <sup>rd</sup>	Blast furnace refractories Stack, Bosh and Hearth lining
7th	1 <sup>st</sup>	Blast furnace refractories Stack, Bosh and Hearth lining
	2 <sup>nd</sup>	Blast furnace cooling arrangement Stack, Hearth & bosh coolers
	3 <sup>rd</sup>	Blast furnace cooling arrangement Stack, Hearth & bosh coolers
8th	1 <sup>st</sup>	Tap hole drilling and Mud gun machine, Cast house, Tuyeres assembly
	2 <sup>nd</sup>	Charging methods and process, Comparison between Double bell charging and bell less top charging
	3 <sup>rd</sup>	Gas cleaning plant

9th	1 <sup>st</sup>	Gas cleaning plant
	2 <sup>nd</sup>	Blast furnace stoves
	3 <sup>rd</sup>	Blast Furnace irregularities and Remedies: Hanging , Scaffolding, Channeling, Slip, Chilled hearth
10th	1 <sup>st</sup>	Pillaring, Break out, Chocking of gas off take
	2 <sup>nd</sup>	Flooding and coke ejection through tap hole, Leaking tuyeres tap holes and coolers
	3 <sup>rd</sup>	Chemistry of Blast Furnace operation:
11th	1 <sup>st</sup>	Blast furnace thermal, physical and chemical profile
	2 <sup>nd</sup>	Blast furnace thermal, physical and chemical profile
	3 <sup>rd</sup>	Boudouard's equilibrium reaction, Direct & indirect reduction
12th	1 <sup>st</sup>	Physical chemistry of blast furnace process: Reactions in stack, bosh, tuyere and hearth zone
	2 <sup>nd</sup>	Physical chemistry of blast furnace process: Reactions in stack, bosh, tuyere and hearth zone
	3 <sup>rd</sup>	Formation of primary slag, bosh slag, and hearth slag.
13th	1 <sup>st</sup>	Slag composition and its control, Metal-slag reactions, Control of hot metal composition.
	2 <sup>nd</sup>	Bell less charging, High top pressure operation,
	3 <sup>rd</sup>	Humidification & oxygen enrichment of blast
14th	1 <sup>st</sup>	Alternative routes of iron making: Sponge Iron Making Process, Conventional versus DRI Steel Making
	2 <sup>nd</sup>	External disiliconisation and desulphurization
	3 <sup>rd</sup>	Rotary hearth, Abnormalities in DRI
15th	1 <sup>st</sup>	HYL Process
	2 <sup>nd</sup>	Gas based DRI Process: MIDREX
	3 <sup>rd</sup>	Smelting Reduction Process: COREX
16th	1 <sup>st</sup>	Production of Ferro-alloys: Different Ferro alloys and their use, Methods of producing Ferro alloys: carbothermic and aluminothermy reductions
	2 <sup>nd</sup>	Production of Ferro manganese
	3 <sup>rd</sup>	Production of Ferro chrome & charge chrome
17th	1 <sup>st</sup>	Production of Fe-Mo and Fe-V
	2 <sup>nd</sup>	Production of ferrosilicon & Fe-Ti
	3 <sup>rd</sup>	Production of Fe-W,

*P. Prasad*  
22/12/25