LESSON PLAN FOR ACADEMIC SESSION: 2025-2026(SUMMER)

Discilpine:Metallurgical Engineering	**Semester : 4th**	**Name of teaching faculty: Rueigved mahanand**
subject: Iron making	No. Of days/week class alloted	Semseter From: 22/12/2025 to 18/04/2026 No.of week per semester : 15
week	**Class Day**	**Theory topics**
1st	1st	Different routes for iron making Raw Materials and their functions
	2nd	Deposits of iron ores flux and coal in India with particular reference to Odisha
	3rd	Different types of iron ores Composition and characteristics of raw materials
2nd	1st	Evaluation of iron ores Metallurgical coal, Difference between coal and coke
	2nd	Required properties of coke for making iron Flux and itstypes, Evaluation of Flux (available base & basicity)
	3rd	Burden Preparation: Quality of burden (physical & chemical properties)
3rd	1st	Agglomeration and itstype (Preparation, Function and Quality requirement of Sinter, Comparison between Sintering and Pelletising)
	2nd	Blast Furnace Fuel: Preparation, Function of coke and Quality requirement of coke
	3rd	Auxiliary fuels Factors affecting fuel consumption in blast furnace
4th	1st	Burden calculation for B/F operation (Material Balance & Heat Balance)
	2nd	Blowing in, blowing out, Banking,
	3rd	, Tapping, Fanning, Back draughting, Slag granulation & their utilization
5th	1st	Blast furnace refractories(Stack, Bosh and Hearth lining)
	2nd	Blast furnace cooling arrangement (Stave, Hearth & bosh coolers)
	3rd	Tap hole drilling and Mud gun machine
6th	1st	Cast house, Tuyeres assembly
	2nd	Charging methods and process, Comparison between Double bell charging and bell less top charging
	3rd	Charging methods and process, Comparison between Double bell charging and bell less top charging
7th	1st	Gas cleaning plant
	2nd	Blast furnace stoves
	3rd	Hanging , Scaffolding, Channeling, Slip
8th	1st	Chilled hearth, Pillaring, Break out, Chocking of gas off take,
	2nd	Chilled hearth, Pillaring, Break out, Chocking of gas off

		take,
	3rd	Flooding and coke ejection through tap hole, Leaking tuyeres tap holes and coolers
9th	1st	Flooding and coke ejection through tap hole, Leaking tuyeres tap holes and coolers
	2nd	Blast furnace thermal, physical and chemical profile
	3rd	Blast furnace thermal, physical and chemical profile
10th	1st	Boudouard's equilibrium reaction
	2nd	Direct & indirect reduction
	3rd	Physical chemistry of blast furnace process: Reactions in stack, bosh, tuyere and hearth zone
11th	1st	Physical chemistry of blast furnace process: Reactions in stack, bosh, tuyere and hearth zone
	2nd	Bell less charging, High top pressure operation, Humidification & oxygen enrichment of blast, External disiliconisation and desulphurization
	3rd	Overview of Sponge Iron Making Process
12th	1st	Conventional versus DRI Steel Making
	2nd	Coal Based DRI process: SL/RN and Rotary hearth, Abnormalities in DRI
	3rd	Gas based DRI Process: MIDREX and HYL
14th	1st	Smelting Reduction Process: COREX Production of Ferro-alloys
	2nd	Different Ferro alloys and their use
	3rd	Methods of producing Ferro alloys: carbothermic and aluminothermy reductions
15th	1st	Refining of Ferro alloys.
	2nd	Production of individual Ferro alloys: Ferro manganese, Ferro chrome, charge chrome, ferrosilicon Fe-Ti, Fe-W, Fe-Mo and Fe-V
	3rd	Revision

22/12/25

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