

Govt. Polytechnic, Mayurbhanj Session: 2026-27
Lesson Plan

Discipline: Metallurgical Engineering	Semester: 3rd	Name of the Teaching Faculty: Sumeeta Rani Sarap	
Subject: Fuel ,Furnace & Refractory (TH-3)	No. of days/per week class allotted: 03	Semester from Date: 01. 07. 2026 to Date: 05.11.2026 No. of weeks: 15	
Week	Class	Module	Lecture Topic
1	1	Unit I	Introduction to Fuels
	2		Classification of Fuels (Solid, Liquid & Gaseous)
	3		Sources of Fuels and Industrial Uses
2	4		Calorific Value – Gross & Net Calorific Value
	5		Numerical Problems on Calorific Value
	6		Proximate Analysis of Fuels
3	7		Ultimate Analysis of Fuels
	8		Physical & Chemical Properties of Fuels
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4	10		Tutorial/Revision & Unit-I Test
	11	Unit II	Origin of Coal
	12		Types and Classification of Coal
5	13		Composition and Characteristics of Coal
	14		Coking Properties of Coal
	15		Swelling Index of Coal
6	16		Carbonization of Coal
	17		High Temperature

			Carbonization (HTC)
	18		Low Temperature Carbonization (LTC)

7	19		Difference between HTC and LTC
	20		Coke Testing - Shatter Index
	21		Coke Testing - Micum Index
8	22		Origin of Petroleum
	23		Constitution of Petroleum
	24		Flash Point & Fire Point
9	25		Cloud Point & Pour Point
	26		Aniline Point, Octane Number & Cetane Number
	27		CLASS TEST
10	28		Methane - Production & Uses
	29		Water Gas & Producer Gas
	30		Carbureted Water Gas, Coke Oven Gas & Blast Furnace Gas
11	31	Unit III	Natural Gas & Mixed Gas
	32		Unit-II Revision & Assignment
	33		Introduction to Furnaces, Heat Treatment Furnaces
12	34		Melting and Smelting Furnaces
	35		Refining Furnaces, Heat Losses in Furnaces
	36		Waste Heat Recovery - Regenerators & Recuperators
13	37		Introduction to Refractories
	38		Classification of Refractories, Properties of Refractories
	39		Special Refractories - High Alumina & Mullite
14	40	Unit IV	Unit-III Revision & Assignment
	41		Special Refractories - Silicon Carbide & Zirconia

15	42	----
	43	CLASS TEST
	44	Selection of Refractories for Blast Furnace, LD Furnace, Arc Furnace & Coke Oven
	45	Revision & discussion

Course co-ordinator

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METALLURGY