

LESSON PLAN FOR ACADEMIC SESSION: 2026-27 (WINTER)

Discipline: Metallurgical Engineering	Semester : 3rd	Name of the Teaching Faculty : Arpita Jena
Subject : Fuel Testing & Chemical Analysis Laboratory	No. of days / week class allotted : 04	Semester From : 20/07/2026 to 05/11/2026 Nos. of Weeks per semester : 15

Week	Class Day	Theory Topics
1ST	1st	Orientation, Safety Rules & Introduction to Fuel Testing & Chemical Analysis Laboratory
	2nd	Recap of Classification of Fuels and Importance of Fuel & Chemical Analysis in Industry
	3rd	Study of Laboratory Apparatus – Muffle Furnace, Analytical Balance, Silica Crucibles
	4th	Study of Apparatus – Bomb Calorimeter and Pensky Marten's Apparatus (Construction & Working)
2ND	1st	Exp-1: Proximate Analysis of Coal – Determination of Moisture Content – Procedure
	2nd	Exp-1: Proximate Analysis of Coal – Determination of Ash Content – Procedure
	3rd	Exp-1: Proximate Analysis of Coal – Determination of Volatile Matter – Procedure
	4th	Exp-1: Proximate Analysis of Coal – Determination of Fixed Carbon – Observation & Calculation
3RD	1st	Exp-2: Flash and Fire Point of Petrol using Pensky Marten's Apparatus – Principle & Procedure
	2nd	Exp-2: Flash and Fire Point of Petrol – Observation & Calculation
	3rd	Exp-3: Flash and Fire Point of Diesel using Pensky Marten's Apparatus – Principle & Procedure
	4th	Exp-3: Flash and Fire Point of Diesel – Observation & Calculation
4TH	1st	Principles of Volumetric / Titrimetric Analysis of Ores and Alloys
	2nd	Exp-4: Determination of Fe in Iron Ore – Principle & Procedure (Titration Method)
	3rd	Exp-4: Determination of Fe in Iron Ore – Observation & Calculation
	4th	Exp-5: Determination of Mg in Dolomite Ore – Principle & Procedure
5TH	1st	Exp-5: Determination of Mg in Dolomite Ore – Observation & Calculation
	2nd	Study of Bomb Calorimeter – Construction, Working and Standardization
	3rd	Exp-6: Determination of Calorific Value of Coal using Bomb Calorimeter – Procedure
	4th	Exp-6: Determination of Calorific Value of Coal – Observation & Calculation
6TH	1st	Exp-7: Determination of Cu and Zn in Brass – Sample Preparation & Principle
	2nd	Exp-7: Determination of Cu in Brass – Procedure, Observation & Calculation
	3rd	Exp-7: Determination of Zn in Brass – Procedure

Week	Class Day	Theory Topics
	4th	Exp-7: Determination of Zn in Brass – Observation & Calculation
7TH	1st	Study of Coke Testing – Introduction to Micum Index and Shatter Index
	2nd	Exp-8: Determination of Micum Index of Given Coal/Coke Sample – Procedure
	3rd	Exp-8: Determination of Micum Index – Observation & Calculation
	4th	Exp-9: Determination of Shatter Index of Given Coal/Coke Sample – Procedure
8TH	1st	Exp-9: Determination of Shatter Index – Observation & Calculation
	2nd	Comparative Study of Coal and Coke Properties Based on Test Results
	3rd	Revision – Proximate Analysis and Flash/Fire Point Experiments (Exp 1, 2, 3)
	4th	Revision – Fe, Mg and Calorific Value Experiments (Exp 4, 5, 6)
9TH	1st	Additional Practice – Proximate Analysis of Coal (Different Sample) – Moisture & Ash
	2nd	Additional Practice – Proximate Analysis of Coal (Different Sample) – Volatile Matter & Fixed Carbon
	3rd	Additional Practice – Flash and Fire Point of Petrol (Repeat Trial)
	4th	Additional Practice – Flash and Fire Point of Diesel (Repeat Trial)
10TH	1st	Additional Practice – Determination of Fe in Iron Ore (Repeat Trial)
	2nd	Additional Practice – Determination of Mg in Dolomite Ore (Repeat Trial)
	3rd	Additional Practice – Calorific Value of Coal (Repeat Trial)
	4th	Additional Practice – Determination of Cu, Zn in Brass (Repeat Trial)
11TH	1st	Additional Practice – Micum Index (Repeat Trial with Different Coke Sample)
	2nd	Additional Practice – Shatter Index (Repeat Trial with Different Coke Sample)
	3rd	Case Study – Role of Fuel Testing in Thermal Power Plants and Steel Industry
	4th	Case Study – Importance of Chemical Analysis in Quality Control of Ores and Alloys
12TH	1st	Discussion on ASTM / IS Standards for Fuel Testing and Chemical Analysis
	2nd	Safety Precautions and Waste Disposal in Fuel Testing & Chemical Analysis Lab
	3rd	Revision – Fuel Testing Experiments (Exp 1, 2, 3)
	4th	Revision – Chemical Analysis Experiments (Exp 4, 5, 7)
13TH	1st	Revision – Calorimetry and Coke Testing Experiments (Exp 6, 8, 9)
	2nd	Practical Report Writing and Documentation of Experiments
	3rd	Practical File Compilation – Fuel Testing Experiments
	4th	Practical File Compilation – Chemical Analysis Experiments
14TH	1st	Practical File Compilation – Coke Testing Experiments
	2nd	Preparation for End Term Practical Examination
	3rd	Mock Viva-Voce and Demonstration

Week	Class Day	Theory Topics
	4th	Doubt Clearing Session / Q&A
15TH	1st	Revision
	2nd	Revision
	3rd	Practical End Term Examination
	4th	Practical End Term Examination

Prepared by	Head of the Department	Academic co-ordinator
Arpita Jena	(Metallurgy Engineering)	GP Sonepur

Ajeng
20/7/26

Ranahant
20/07/26

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