

Lesson Plan For
Ferrous Metallurgy – I (2020-21)
Department of Metallurgical Engineering
UGIE Rourkela

Discipline: **Metallurgical Engineering**

Subject: **Material Testing (TH-01)**

Semester: **4th**

Total Period allotted: **60**

Period per week: **4**

Name of the Teaching Faculty: **Goutam Kumar Majhi**

Week	Class No.		Lecture Topics
1	1	Chapter -2: Tensile Test :	Introduction
	2		Basic concepts about stress and strain
	3		Tensile testing
	4		stress-strain curve
2	5		-do-
	6		modulus of elasticity, proof stress
	7		UTS & Fracture stress
	8		ductility and toughness
3	9		True stress and true strain curve.
	10		yield point phenomenon
	11		-do-
	12		Chapter-1:
4	13	Hardness Test	Hardness of a material
	14		rebound hardness with reference to shore's Scleroscope
	15		scratch hardness and explain mho's scale
	16		-do-
	17		Brinel Hardness Test
	18		-do-
	19		Rockwell hardness test
	20		-do-
6	21		Vickers hardness test
			-do-

7	22	Chapter-3: Impact Test	impact strength
	23		Charpy impact test
	24		Izod impact test
	25		transition temperature
	26		ductility, brittle fracture
	27		-do-
	28		Tutorial Class
8	29	Chapter-4: Fatigue Test	stress cycles
	30		-do-
	31		S-N curve
	32		endurance limit
9	33		fatigue testing and fatigue testing machine
	34		-do-
	35		metallurgical factors that affect fatigue behaviour
	36		-do-
10	37	Chapter-5: Creep Test	creep and its importance
	38		engineering creep curve
	39		constant stress creep curve
	40		Andrade concept
11	41		equicohesive temperature
	42		factors that affect creep
	43		creep testing machine
	44		stress rupture test
12	45	Chapter- 6: Non – destructive Testing	scope and elementary idea about different NDT
	46		-do-
	47		Visual testing
	48		Leakage test
13	49		Magnetic particle testing
	50		Dye penetration test
	51		Acoustic methods and ultrasonic testing
	52		Eddy current testing
14	53	Chapter- 7: Temperature Measurement and Calibration	X – ray diffraction
	54		Analysis the basic principle of pyrometry
	55		-do-
	56		types of pyrometer
15	57		types of thermocouple
	58		Revision Class-I
	59		Revision Class-II
	60		Important question discussion