



VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

Department of Metallurgy & Materials Engineering

Lesson Plan – Testing of Materials (TM)

Subject Name	:	:	Testing of Materials
Credits	:	:	3 – 0 – 0 - 3
Department	:	:	Metallurgy & Materials Engineering
Session	:	:	2016 - 17 (Even Semester)
Level	:	:	Undergraduate (VI - Semester)
Course Instructor	:	:	Dr. Sushant Ku. BadJena
Category	:	:	Compulsory course for all B. Tech VI Semester students of MME Department.

Class Schedule			
Wednesday – B320	Thursday – B320	Friday – B320	Saturday – B320
9:40-10:30 AM	11:20-12:10 PM	11:20-12:10 PM	9:40-10:30 AM

Marks Distribution		
End Term	Mid Term	Assignments + Quizzes
70	20	10
Total -100 Marks		

Text Books:

1. Mechanical Metallurgy George E. Dieter
2. Materials Testing by S. Bhargava

Dr. S.K. BadJena
Course Coordinator

COURSE CONTENTS

Sl. No	TOPIC	HOURS
1.	Introduction to the course & scope of the subject	1
2.	Engineering materials and their applications	1
3.	Testing of materials: Types of testing systems	1
4.	Significance of measurement of properties and test conditions	1
5.	Interpretation of test results	1
6.	Tensile Testing: significance of measured parameters	1
7.	Necking, stress distribution	1
8.	Ductility measurement	1
9.	Effect of gauge length	
10.	Effect of strain rate and temperature on flow properties	
11.	Machine stiffness in tensile testing system	1
12.	Measuring instrument computerization	1
13.	Torsion Test: Mechanical properties in torsion	1
14.	Torsion vs Tension test.	1
15.	Hardness Test	1
16.	Rockwell, Brinell	1
17.	Vickers and micro-hardness	1
18.	Elastic and plastic behavior during hardness testing	1
19.	Special hardness tests: superficial, micro and shore	1
20.	Fracture Mechanics	1
21.	Introduction, Strain-Energy	1
22.	Release Rate	1
23.	Stress Intensity Factor	1
24.	Fracture Toughness and Design	1
25.	K_{Ic} Plane-Strain Toughness Testing	1
26.	Ductile, brittle fracture	1
27.	Griffith theory	1
28.	Ductile to brittle transition	1
29.	Notch effect in fracture	1
30.	Fatigue Tests	1
31.	Stress cycles, SN curve	1
32.	Effect of stress concentration	1
33.	Size and surface conditions on fatigue	1
34.	Creep	1
35.	Stress rupture tests	1
36.	Creep curve and its analysis	1
37.	Non-destructive Testing	1
38.	Visual, magnetic, radiographic, ultrasonic	1
39.	Electromagnetic, penetrant tests	1
40.	Their applications in quality control and inspection	1
	Total	40

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