VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

Lesson - Plan

Department/Program: Production Engineering, B.Tech

Academic Session: 2020-21   **Semester: 4th**

Subject Name: Strength of Materials   **Subject Code: BPE04002**

Teacher: Dr. Arun Kumar Rout

Module No.	Module Name:	Topics/Coverage	No.of Lectures	Lecture Serial No.
1 & 2	Introduction to Concept of stress and strain, Two Dimensional Stress system, Strain &	Analysis of axially loaded members: Composite bars in tension and compression-temprature stresses in composite rods-statically indeterminate problem.	4	1-12
		2D Stress system, Principal Planes, Principal stress, Mohr's stress circle, Members in biaxial state of stress: Stresses in thin cylinders, thin spherical shells under internal pressure-wire winding of thin cylinders.	4	
		Strain & deformation: Two dimensional state of strain, Principal Strains, Calculation of principle stresses from principal strains, Strain measurement.	4	
3	Shear force and Bending Moment diagrams	Shear force and bending moment diagrams for simple beams: Support reactions for statically determinate beams, relationship between bending moment and shear force, shear force and bending moment diagrams.	6	13-22
		Simple bending of beams: Theory of simple bending of initially straight beams, distribution of normal and shear stress, composite beams.	4	

QUIZ TEST – 1

MID SEMESTER EXAM

| 4 | Torsion in solid and hollow | Torsion in solid and hollow circular shafts, twisting moment, strength of solid | 6 | 23-32 |

Module No.	Module Name:	Topics/Coverage	No. of Lectures	Lecture Serial No.
	Shafts and deflection of beams	And hollow circular shafts, strength of shafts in combined bending and twisting, Close-coiled helical springs.	4	
5	Buckling of columns and Theories of failure	Buckling of columns: Euler's theory for initially straight columns with various end conditions. Theories of failure: maximum principal stress theory, maximum shear stress theory, maximum principal strain theory, maximum strain energy theory and maximum distortion energy theory.	4	33-40

QUIZ TEST – 2

END SEMESTER EXAMINATIONS

TEXT BOOK(S):

1. Strength of Materials- G.H. Ryder, Macmillian India.
2. Mechanics of Materials- J.M. Gere and S. Timoshenko
3. Strength of Materials- S.S. Ratan, TMH Publications

REFERENCE(S):

1. Mechanics of Materials- I – E.J. Hern; Paragaman
2. Introduction to Mechanics of Solids – Crandell, Dahl and Lardner, Mc Graw Hill.
3. Mechanics of Materials – Beer & Johnson
4. Strength of Materials – S. Ramamrutham
5. Mechanics of Material – S S Ratan, TMH
6. Mechanics of Materials – L Srinath

Signature of Subject Coordinator

To

The Head of the Department