



## **C.U.SHAH UNIVERSITY – Wadhwan City**

**FACULTY OF:** -Technology and Engineering (Diploma Engineering)

**DEPARTMENT OF:** -Civil Engineering

**SEMESTER:** - III **CODE:** -2TE03MST1

**NAME** – Mechanics of Structures

### **Teaching & Evaluation Scheme:-**

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)		Total	
											Internal			University
							Sessional Exam		University Exam		Pr	TW		Pr
						Marks	Hours	Marks	Hours					
2TE03MST1	Mechanics of Structures	03	00	02	05	04	30	1.5	70	03	30	20	---	150

**Objectives:** To equip the students with comprehensive knowledge of Mechanics of Structure so as to enable them to design the structure.

**Prerequisites:** Fundamental knowledge of principles of forces and deformations..

### **Course Outlines:-**

Sr. No.	Course Contents	Teaching Hours
1	<b>Stress and Strain:</b> Hook's law. Modulus of elasticity, Modulus of rigidity, Bulk Modulus, Poisson's ratio, simple shear, complementary shear, relation between E, G, K. Behavior of mild steel under tension, load extension curve, yield stress, factor of safety, working stresses. Temperature stresses. Stresses in composite sections under axial loading	08
2	<b>Beams:</b> Bending moments, shear force and axial forces in simply supported cantilever and overhanging beams. Plotting of B.M.D., S.F.D., and A.F.D. for concentrated and uniformly distributed loads. Relation between shear force and bending moments at a section, point of contra flexure.	10
3	<b>Simple theory of Bending:</b> Flexure formula for straight prismatic beams, Principle axes and moment of a section, moment of resistance, simple problem in application of flexure formula, fletched beams.	05
4	<b>Shear stresses:</b> Distributions of shear stresses across plane section and I beams.	03
5	<b>Bending combined with axial loads:</b> Eccentric loading of a section, middle third rule, core of section.	04
6	<b>Principle stresses and Principle planes:</b> Stresses in oblique planes, principle plane and stresses, Analytical and Graphical methods	06

7	<b>Bolted and welded joints:</b> Various types of bolted and welded joints, modes of failure, Efficiency of joints.	04
8	<b>Deflection of beams:</b> Double integration method, moment area methods and conjugate beam Method. Application to simply supported beams, cantilever and over hanging beams.	05

### Experiment List:-

- Tension test on M.S. bar.
- Briell Hardness Test on M.S., C.I. & Brass specimen
- Izod impact test on M.S. bar and brass specimen
- Torsion test on M.S specimen
- Shear test on M.S. , C.I. brass specimen
- Transverse test on Cast Iron
- Rockwell hardness test
- Vickers Hardness test

### Learning Outcomes:

- Knowledge of all the essential principles and their application to designs.
- Ability to create new designs of structures..

### Books Recommended:-

- Mechanics of structures by **S. B. Junnarkar**, Charotar Publishing. House 21st edition 2010
- Strength of Materials by **S. Ramamrutham**, Dhanpat Rai publication edition 15th 2006
- Strength of materials by **C.H. Ryder**, Macmillan publisher's edition 2002