GTU MID SEM SYLLABUS

Subject: **FUNDAMENTAL OF MACHINE DESIGN (3141907)**

Academic Year:2022-23(Even)　　　　Class: 4th　　　　Semester(Div: A & B)

Basics of stress and strain: 3 -D state of stress (Concept only) Normal/axial stresses: Tensile & compressive Stresses: Shear and complementary shear Strains: Linear, shear, lateral, thermal and volumetric. Hooke's law, Elastic Constants: Modulus of elasticity, Poisson's ratio, Modulus of rigidity and bulk modulus and relations between them with derivation.	CO1
Moment of inertia of planar cross -sections: Derivation of equation of moment of inertia of standard lamina using first principle, Parallel & perpendicular axes theorems, polar moment of inertia,	CO1
Flexural stresses – Theory of simple bending, Assumptions, derivation of equation of bending, neutral axis, determination of bending stresses, section modulus of rectangular & circular (solid & hollow), I,T, Angle, channel sections	CO1
Design Against Static Load: Concepts of stresses and Strain, Combinations of Axial, Shear, Torsional and Bending loads; Theories of Failures: Distortion energy (von Mises), Maximum-Shear stress, Maximum Principal stress, Selection and Use of theories of failures; Factor of safety, Contact stresses, Crushing and Bearing stress. Application Problems: Eccentric Loading; Cotter and Knuckle Joints; Design and analysis of levers: Cranked, Bell crank, Foot, Rocker arm.	CO2 CO3
Shafts and Keys: Design of solid and hollow circular shaft subjected to torque and combined loading for rigidity and stiffness;	CO2 CO3

Faculties: Prof K.K.DAVE,

　　　　Prof A B KHANT

　　　　Prof A N DAVE (sub Incharge)