Year & Sem: E1S1	Lab Code: ME1101	Lab Name: **Engineering Mechanics**	No. of Credits: 2	L	T&PS	P
				0	0	2

UNIT-I: Force systems: Introduction, Forces acting at a point, Moment of a force about a point and about an axis; couple moment; reduction of a force system to a force and a couple. Equilibrium : Free body diagram; equations of equilibrium; problems in two and three dimensions; plane frames and trusses.

UNIT-II: Friction : Laws of Coulomb friction., problems involving large and small contact surfaces; square threaded screws; belt friction; rolling resistance.

UNIT-III: Kinematics and Kinetics of particles: Particle dynamics in rectangular coordinates cylindrical coordinates and in terms of path variables; central force motion.

UNIT-IV: Properties of areas : Centroid and Centre of gravity, Moments of inertia and product of inertia of areas, polar moment of inertia, principal axes and principal moments of inertia. Concept of stress and strain : Normal stress, shear stress, state of stress at a point, ultimate strength, allowable stress, factor of safety; normal strain, shear strain, Poissons ratio, generalized Hook's law; analysis of axially loaded members.

UNIT-V: Torsion: Torsion of cylindrical bars, torsional stress, modulus of rigidity and deformation. Flexural loading : Shear and moment in beams; load, shear and moment relationship; shear and moment diagrams; flexure formula; shear stress in beams; differential equation of the elastic curve, deflection of beams.

UNIT-VI: Transformation of stress and strain : Transformation of stress and strain, principal stresses, principal strains, Mohr's circle for stress and strain. Combined loading: Axial and torsional; axial and bending; axial, torsional and bending. Books related to mechanics:

References/ Books:

1. Vector mechanics for Engineers by P. Beer and Russel Johnson,
2. Solid mechanics by Popov