ENGINEERING MECHANICS

Module-I (10Hours)
Concurrent forces on a plane: Composition, resolution and equilibrium of concurrent coplanar forces, method of moment. General case of forces on a plane: Composition and equilibrium of forces in a plane, plane trusses, method of joints and method of sections.

Module-II (6 Hours)
Friction: Fundamentals and Problems involving friction, Ladder, Wedges. Principle of virtual work.

Module - III (8Hours)
Parallel forces on a plane: General case of parallel forces, center of parallel forces and center of gravity, Centroid of plane and composite figures, Theorems of Pappus and Guildins. Moment of inertia: Plane figure with respect to an axis in its plane and perpendicular to the plane, Polar moment of inertia, parallel axis theorem.

Module – IV (8 Hours)
Rectilinear translation: Kinematics, Principle of dynamics, D Alembert‟s Principle, Principle of work and energy for a particle and a rigid body, Conservation of energy, Principle of impulse and momentum for a particle and a rigid body, Conservation of momentum, System of rigid bodies, Impact, direct and central impact, coefficient of restitution.

Module – V (8 Hours)
Curvilinear translation: Kinematics, Equation of motion, Projectile, D Alembert‟s principle of curvilinear motion. Kinematics of rotation of rigid body.

Essential Reading:
1. Engineering Mechanics: S. Timoshenko, D.H. Young, J.V. Rao, Sukumar Pati,5th Edition,2017 McGraw Hill.

Supplementary Reading:
1. Engineering Mechanics, Static and Dynamics, J. L. Meriam and L.G.Kraige, 9th Edition,2021, John Wiley & Sons, Inc.
2. Fundamental of Engineering mechanics, S Rajesekharan& G ShankaraSubramanium,3rd Edition, 2017, S. Chand .
3. Engineering mechanics: K. L. Kumar andVeenuKumar, 4th Edition,2017, Tata MC Graw Hill.

Upon completion of the subject the students will be able to:

CO1	Ability to analyze objects in static equilibrium including the determination of reactions, forces and moments.
CO2	Enrichfundamental concept offriction and demonstrate the analytical skills to solve the problems involving friction.
CO3	Assimilatingthe knowledge for determination of centroid and second moment of area of sectionsand their engineering applications.
CO4	To analyze the work done by forces, the energy transferred from one object to other and apply principle of work and energy conservation for realistic (/Practical) engineering problems.
CO5	Identify the various parameters in projectile motion. Apply the principle of dynamics to analyze the curvilinear motion of rigid bodies.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	-	-	-	3	1	-	1
CO2	3	3	2	1	2	-	-	-	3	1	-	1
CO3	3	3	2	1	2	-	-	-	3	1	-	1
CO4	3	3	2	1	2	-	-	-	3	1	-	1
CO5	3	3	2	1	2	-	-	-	3	1	-	1

Program Articulation Matrix Row for this Course

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO	3	3	2	1	2	-	-	-	3	1	-	1