Engineering Mechanics

F.E. Sem. I

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical & Oral Exam	2	25
Oral Exam	–	–
Term Work	–	25

SYLLABUS

1. **System of Coplanar Forces :**
   - Resultant of concurrent forces, Parallel forces and Non concurrent Non parallel system of forces. Moment of Force about any point, Couples, Varignon's Theorem Distributed Forces in plane.
   - Introduction to Centroid and Center of Gravity, Introduction to Moment of Inertia and its theorem.

2. **Equilibrium of System of coplanar forces :**
   - Condition of equilibrium for concurrent forces, Parallel forces and Non concurrent Non-parallel general system of forces and couples.
   - Types of supports, loads, Beams. Determination reactions at supports for various types of loads on beams.
   - Analysis of plane trusses by using Method of Sections and Method of Joints.

3. **Friction :** Introduction to Laws of Friction, Cone of friction, Equilibrium of bodies on inclined plane, Application to problems involving wedges, ladders, screw friction.

   Belt Friction : Transmission of power by belts and ropes, centrifugal and initial tension in the belts or ropes. Condition of maximum power transmission. Flat belt and flat pulleys and ropes on grooved pulleys.

4. **Kinematics of Particle :** Velocity and acceleration in terms of rectangular co–ordinate system, Rectilinear motion, Motion along plane curved path, Tangential and Normal component of acceleration, Motion curves a – t, y – t, st , Projectile Motion, Relative velocities.

5. **Kinematics of Rigid Bodies :** Introduction to general plane motion, Instantaneous center of rotation for the velocity, velocity diagrams for bodies in plane motion, (up to two linkage mechanism)

6. **Kinetics of Particles :** Introduction to basis concept, Newton's second law, work energy principles, D'Alembert's principles, equation of dynamic equilibrium.

   Moment of Energy Principles : linear momentum, principles of conservation of momentum, Impact of solid Bodies, Direct and oblique impact, impact of solid bodies, semi elastic impact and plastic impact.

Reference :

1. Engineering Mechanics – (*R.C. Hibblar*), Mac Millan
2. Engineering Mechanics – (*B.N.Thadani*), Weinell Book Corporation
3. Engineering Mechanics – (*Beer & Johnson*), Tata Mcgrawhill
4. Engineering Mechanics – (*F.L. Singer*), Harper & Row Publication
5. Engineering Mechanics – (*Macklin & Nelson*), Tata Mcgrawhill
6. Engineering Mechanics – Shaum Series
7. Engineering Mechanics – (*Tayal*), Umesh Publication
8. Engineering Mechanics – (*Kumar*), Tata Mcgrawhill

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