

Engineering Mechanics

F.E. Sem. I

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	80
Practical & Oral Exam	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

- 1. System of Coplanar forces.** Resultant of Concurrent forces, Parallel forces, Non Concurrent, Non Parallel system of forces, Moment of force about a point, Couples, Varignon's Theorem, Distributed Forces in plane.

Center of Gravity and Centroid for plane Laminas.

- 2. Equilibrium of system of coplanar forces**

- Condition of equilibrium for concurrent forces, parallel forces and Non concurrent Non Parallel general forces and Couples.
- **Types of support**, loads, Beams, Determination of reactions at supports for various types of loads on beams.
- **Analysis of plane trusses** by using Method of joints and Method of sections.(Excluding pin jointed frames)

- 3. Forces in Space**

- **Resultant of Noncoplanar force systems** : Resultant of Concurrent force system, Parallel force system and Nonconcurrent nonparallel force system.
- **Equilibrium of Noncoplanar force systems** : Equilibrium of Concurrent force system, Parallel force system and Nonconcurrent nonparallel force system.
- **Friction** : Introduction to Laws of friction, Cone of friction, Equilibrium of bodies on inclined plane, Application to problems involving wedges, ladders.

- 4. Kinematics of Particle**

Velocity & acceleration in terms of rectangular co-ordinate system, Rectilinear motion, Motion along plane curved path, Tangential & Normal component of acceleration, Motion curves (a-t, v-t, s-t curves), 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 2 linkage mechanism)

- 6. Kinetics of a Particle**

- **Force and Acceleration** : Introduction to basic concepts, D'Alemberts Principle, Equations of dynamic equilibrium, Newton's Second law of motion.
 - **Work and Energy** : Principle of Work and Energy, Law of Conservation of Energy.
 - **Impulse and Momentum** : Principle of Linear Impulse and Momentum. Law of Conservation of momentum. Impact and collision.
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Mumbai University Question Paper Format

- 1) Question paper will comprise of 6 questions, each carrying 20 marks.
- 2) Total 4 question need to be solved.
- 3) Question No. 1 will be compulsory, based on entire syllabus wherein sub question of 2 to 3 marks will be asked.
- 4) Remaining questions will be mixed in nature. (e.g. Suppose Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3) having 15 marks each.
- 5) In question paper weightage of each module will be proportional to number of respective lecture hours as mentioned in the syllabus.

Reference Books :

- 1) Engineering Mechanics (*Hibblar*) McMillan.
- 2) Engineering Mechanics (*Beer & Johnson*) Tata McGraw Hill
- 3) Engineering Mechanics (*Merium*) Wiley.
- 4) Engineering Mechanics (*F. L. Singer*) Harper & Raw Publication
- 5) Engineering Mechanics (*Macklin & Nelson*) Tata McGraw Hill
- 6) Engineering Mechanics, Shaum Series.
- 7) Engineering Mechanics (*Tayal*) Umesh Publication.

