

# AMR-02 ENGINEERING MECHANICS

## UNIT-1 GENERAL COPLANAR FORCE SYSTEMS

- 1.1 Basis concepts, Law of motions, principle of transmissibility of forces,
- 1.2 Transfer of a force to parallel position, Resultant of a force system, simplest resultant of two dimensional concurrent & non concurrent force systems,
- 1.3 Free body diagrams, equilibrium & its equations, applications.

## UNIT-2 TRUSSES & CABLES

- 2.1 Introductions, simple truss & solutions of simple truss,
- 2.2 Method of joints & method of sections.

## UNIT-3 FRICTION

- 3.1 Introduction, Laws of coulomb friction, equilibrium of bodies involving dry friction, belt friction, applications.

## UNIT-4 CENTRE OF GRAVITY, CENTROID, MOMENT OF INERTIA

- 4.1 Centroid of plane, curve, area ,volume & composite bodies, moment of inertia of plane area, parallel axis theorem, perpendicular axis theorem,
- 4.2 Principal moment inertia, mass moment of inertia of circular ring, disc, cylinder, sphere and cone about their axis of symmetry.

## UNIT-5 BEAMS

- 5.1 Introductions, shear force and bending moment, differential equations for equilibrium,
- 5.2 Shear force & bending moment's diagrams for statically determinate beams.

## UNIT-6 KINEMATICS OF RIGID BODY

- 6.1 Introduction, plane motion of rigid bodies,
- 6.2 Velocity & acceleration under translation & rotational motion,
- 6.3 Relative velocity, projectile motion.

## UNIT-7 KINETICS OF RIGID BODIES:

- 7.1 Introduction, force, mass & acceleration, work & energy,
- 7.2 Impulse & momentum, D'Alembert principles & dynamic equilibrium.
- 7.3 Virtual work.

### Reference Books :

1. Beer F.P. & Johnston ,F.R. “ Mechanics For Engineers”, McGraw Hill.
2. Shames, I.H. “ Engg. Mechanics” , P H I.
3. Meriam , J. L. “ Statics” , J. Wiley.