

ID1130 ENGINEERING STATICS

Credits: 2 Semester: Jul Segment: 13

Particle, deformable and rigid bodies, statics, dynamics, fundamental laws of mechanics, parallelogram law and triangular law, vector operations; Resultant of coplanar and concurrent forces; Components of forces in space; Equilibrium of a particle and a rigid body. Trusses, Frames and Machines, analysis of forces in trusses using the method of joints and the method of sections; Special conditions in truss members: zero-force members; Condition of statically determinate system; Force analysis in frames and machines. Internal forces-normal or axial force, shear force, bending moment, torsional moment; Sign convention for different internal forces; Application of the method of sections to determine internal forces; Relationship between applied load, shear force, and bending moment; Method of superposition to obtain shear force diagram and bending moment diagram.

Friction: Introduction to the concept of dry friction, Equilibrium of rigid bodies subjected to dry friction; Examples demonstrating the application of frictions on wedges, screws, belts, and bearings; Concept of rolling resistance. Center of gravity and centroid; Moment of inertia; Theorems of Pappus and Guldinus; Moment of inertia for simple geometries; Parallel-axis theorem; Perpendicular-axis theorem; Polar moment of area; Radius of gyration; Application to Composite areas; Mass moment of inertia.