**GE8292 ENGINEERING MECHANICS L T P C**

 **3 2 0 4**

**UNIT I BASICS AND STATICS OF PARTICLES 15**

Introduction – Units and Dimensions – Laws of Mechanics – Lami’s theorem, Parallelogram and triangular Law of forces –– Vectorial representation of forces – Vector operations of forces -additions, subtraction, dot product, cross product – Coplanar Forces – rectangular components – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility .

**UNIT II EQUILIBRIUM OF RIGID BODIES 15**

Free body diagram – Types of supports –Action and reaction forces –stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem – Single equivalent force -Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions.

**UNIT III PROPERTIES OF SURFACES AND SOLIDS 15**

Centroids and centre of mass– Centroids of lines and areas - Rectangular, circular, triangular areas by integration – T section, I section, - Angle section, Hollow section by using standard formula – Theorems of Pappus - Area moments of inertia of plane areas – Rectangular, circular, triangular areas by integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem –Principal moments of inertia of plane areas – Principal axes of inertia-Mass moment of inertia –mass moment of inertia for prismatic, cylindrical and spherical solids from first principle – Relation to area moments of inertia.

**UNIT IV DYNAMICS OF PARTICLES 15**

Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion - Newton’s laws of motion – Work Energy Equation– Impulse and Momentum – Impact of elastic bodies.

**UNIT V FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS 15**

Friction force – Laws of sliding friction – equilibrium analysis of simple systems with sliding friction – wedge friction-.Rolling resistance -Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion of simple rigid bodies such as cylinder, disc/wheel and sphere.

**Beyond the syllabus**

 **UNIT VI ANALYSIS OF STRUCTURES**

 **Types of support and their reactions- plane trusses and frames- analysis of forces by methods of joints and methods of sections. 05**

**TOTAL 75 + 05=80 HOURS**

**UNIT I TO V - ANNA UNIVERSITY, CHENNAI.**

**UNIT VI - VELLORE INSTITUTE OF TECHNOLOGY,VELLORE.**

 **Faculty in-charge HOD ( HOD) Principal**

 **Affiliated Department Parent department**