

**II B. Tech – II Semester**  
**(20ME4750) CLASSICAL MECHANICS**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	4

**Pre-Requisites:** Engineering physics, Engineering mathematics

**UNIT – I:**

**Introduction to Engg. Mechanics** – Basic Concepts.

**Systems of Forces:** Coplanar Concurrent Forces – Components in Space – Resultant – Moment of Force and its Application – Couples and Resultant of Force Systems.

**UNIT – II:**

**Equilibrium of Systems of Forces:**

Free Body Diagrams, Equations of Equilibrium of Coplanar Systems, Spatial Systems for concurrent forces. Lamis Theorem, Graphical method for the equilibrium of coplanar forces, Converse of the law of Triangle of forces, converse of the law of polygon of forces condition of equilibrium.

**UNIT – III:**

**Centroid:** Centroids of simple figures (from basic principles ) – Centroids of Composite Figures

**Centre of Gravity:** Centre of gravity of simple body (from basis principles), centre of gravity of composite bodies, pappus theorem.

**UNIT – IV:**

**Area moments of Inertia:** Definition – Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia.

**Mass Moment of Inertia:** Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia, mass moment of inertia of composite bodies.

**UNIT – V:**

Analysis of perfect frames ( Analytical Method) – Types of Frames – Assumptions for forces in members of a perfect frame, Method of joints, Method of sections, Force table, Cantilever Trusses, Structures with one end hinged and the other freely supported on rollers carrying horizontal or inclined loads.

**Course Outcomes:**

After successful completion of the course, the students will be able to:

S. No	Course Outcome	BTL
CO1	determine the resultant force and moment for a given force system.	L3
CO2	solve the member forces in trusses.	L3
CO3	solve the centre of gravity and moment of inertia for various geometric shapes	L3
CO4	determine the displacement, velocity and acceleration relations in dynamic systems	L3
CO5	apply the concepts of kinematics, kinetics, work - energy and impulse - momentum methods to particle motion	L3

**Correlation of COs with POs& PSOs:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	1	1	3	2	0	0	3	2	2
CO2	3	3	3	2	2	1	1	3	2	0	0	3	3	1
CO3	3	3	3	3	3	2	1	3	2	0	1	3	3	2
CO4	3	3	2	2	3	2	1	3	2	0	1	3	3	2
CO5	3	3	3	2	3	2	1	3	2	0	1	3	3	2

**Text Books**

1. Engg. Mechanics / Irving. H. Shames Prentice – Hall.
2. Engg. Mechanics / S.S. Bhrikati & J.G. Rajasekharappa

**References:**

1. Engineering Mechanics / Ferdinand . L. Singer / Harper – Collins.
2. Engg. Mechanics / Timoshenko & Yound.
3. Engg. Mechanics Umesh Regl / Tayal.
4. Engg. Mechanics / R.V. Kulkarni & R.D. Askhekar
5. Engg. Mechanics / Khurmi / S. Chand.
6. Engg. Mechanics / KL Kumar / Tata McGraw Hill.