

19ME104

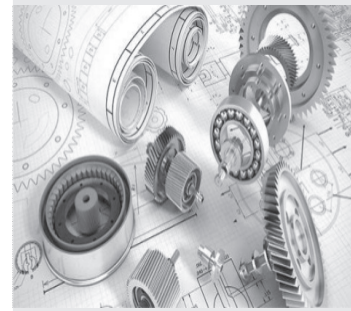
ENGINEERING MECHANICS

Hours Per Week :

L	T	P	C
3	0	0	3

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	0	0	5	40	5	8	5	5



Source :

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COURSE DESCRIPTION AND OBJECTIVES:

To apply principles of mechanics for solving engineering problems. To analyze reaction forces and moments of an equilibrium body directly or indirectly used in our real life, like machines and structures. To enable the students to have an exposure to the systematic methods of solving engineering problems. This course is prerequisite for courses like Mechanics of Solids, Theory of Machines, Stress Analysis, Design of Mechanical systems and others.

COURSE OUTCOMES:

Upon completion of the course, student will be able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Understand, discuss and describe the forces acting on a rigid body for different applications.	---
2	Apply basic knowledge of mathematics and physics to solve real-world problems such as dams, bridges, fly overs, buildings, large structures etc.	1
3	Analyze forces and moments for statically determinate structure.	3
4	Apply various types of structural members subjected to transverse shear and torsion.	3

SKILLS:

- ✓ Solving classical mechanics problems involving system of forces.
- ✓ In-depth understanding of rigid bodies.
- ✓ Understanding of principles of centre of gravity, moment of inertia and radius of gyration.

UNIT - I**L-09**

Basic concepts of Engineering Mechanics: Introduction to Engineering Mechanics, Unit's and Dimensions, Vectors and scalar quantity, Basic Mechanics, Laws of Mechanics. Statics of particles: Concept of force, system of forces, Resultant of forces, Resolution of forces using rectangular component Principle of transmissibility of forces, Parallel forces. Moment of force and Varignon's theorem of moments.

UNIT - II**L-09**

Rigid Body Equilibrium: Free body diagram, condition of equilibrium of rigid body in two dimensions for coplanar force system and coplanar non-parallel non concurrent force system, Lame's theorem.

UNIT - III**L-09**

Friction: Introduction, Classification of friction, Coefficient of friction, Laws of friction, angle of friction, Angle of repose and application of friction.

UNIT - IV**L-09**

Centroid: Centroid of surfaces, Centroid of simple i.e triangle, rectangle, circle, semi circle and quarter circle and composite figures.

UNIT - V**L-09**

Moment of inertia of plane areas: Polar moment of an area, Radius of gyration of area, Parallel axis theorem, Perpendicular axis theorem, Moment of inertia of composite areas.

TEXT BOOK:

1. K. Dhiman, P. Dhiman and D. C. Kulshreshtha, 2015, "Engineering Mechanics: Statics and Dynamics", Mc Graw Hill.

REFERENCE BOOKS:

1. Khurmi, R.S 2014, "A Text Book of Engineering Mechanics", S. Chand and Co. New Delhi.
2. Khurmi, R.S 2015, "A Text Book of Strength of Materials", S. Chand and Co. Ltd New Delhi.
3. Bansal, R.K 2005, "A Text Book of Engineering Mechanics", Laxmi Publications, New Delhi.