

## Engineering Mechanics-I: Statics

<b>Semester No</b> 2	<b>Code</b> ME-113	<b>Credit Hours</b> 3-0
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### COURSE DESCRIPTION:

This course has been spread out keeping in view as this being the foundation to most of the other courses in the discipline of Mechanical Engineering. Thus the primary purpose of the study is to develop the capacity to predict the effects of forces and moments while carrying out the creative design. The capacity to visualize the problems in three dimensional is vital in the designing a stable mechanism.

### TEXT AND MATERIAL

#### Textbooks:

1. Engineering Mechanics Statics & Dynamics by R C Hibbeler, Fourteenth edition

#### Reference Material:

1. Engineering Mechanics by S. Timoshenko & D.A Young
2. Engineering Statics by Beer & Johnstan

### PREREQUISITE:

NIL

### COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the student should be able to:

S No	CLO Statement	PLO	Learning Domain and level
1	Determine Resultant, component of force vectors in a plane or space using Scalar or Vector approach	PLO-1	C3
2	Compute moments about a point and about an axis by Scalar or Vector approach	PLO 1	C3
3	Draw Free Body Diagram and apply equations of equilibrium in 2 and 3 dimensions	PLO-1	C3
4	Compute forces in members of trusses by method of joints and method of sections	PLO-1	C3
5	Solve problems which include frictional forces and friction angles using equilibrium equations	PLO-1	C3

**ASSESSMENT SYSTEM:**

Quizzes	10-15%
Assignments	5-10%
OHTs	30-40%
ESE	40-50 %

**TOPICS COVERED WITH THEIR CONTRIBUTION TO PLOs:**

<b>Week No</b>	<b>Description</b>	<b>Quizzes</b>	<b>Assignment</b>	<b>CLO No</b>
1	Introduction and basic concepts	02	01	1
2	Force Vectors: Vector Operations, Addition of a system of Coplanar Forces, Addition and Subtraction			
3	Cartesian Vectors, Position Vectors, Force vector directed along a of line, Dot Product			
4	Equilibrium of a Particle: Conditions for the equilibrium of a Particle			
5	Free Body Diagram, Coplanar Force Systems, Three-Dimensional Force Systems			
6	Force System Resultants: Moment of a Force Scalar and Vector Formulation, Cross Product, principles of Moments			
7	<b>OHT 1</b>			

8	Moment of a Force about a specified Axis and Moment of a Couple, Equivalent System, Resultant of a Force and Couple System			
9	Equilibrium of a Rigid Body: Conditions of Rigid Body Equilibrium, Equilibrium in Two Dimensional, Free Body Diagrams,			
10	Equations of Equilibrium, Two and Three Force members, Constraints for a Rigid Body	02	01	2, 3
11	Structural Analysis: Simple Trusses, Method of Joints			
12	Zero Force Member, Method of Sections, Frames and Machines			
13	<b>OHT 2</b>			
14	Friction: Characteristic of dry friction, Problems involving dry friction, Wedges			
15	Centroids and Moment of Inertia: Center of Gravity and center of mass, Centroid for a body, Composite Bodies,			
16	Moment of Inertia for Areas, Parallel Axis Theorem, Radius of Gyration.	02	01	4
17	Revision			
18	<b>END SEMESTER EXAMINATION</b>			