

Engineering Mechanics

By:

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Introduction

- Engineering mechanics is the branch of science which deals with the behavior of a body when the body is at rest or in motion.
- It also deals with the laws and principles of Mechanics, along with their applications to engineering problems. As a matter of fact, knowledge of Engineering Mechanics is very essential for an engineer in planning, designing and construction of his various types of structures and machines

DIVISIONS OF ENGINEERING MECHANICS

Engineering Mechanics may be divided into the following two main groups:

1. Statics
2. Dynamics.

STATICS

It is that branch of Engineering Mechanics, which deals with the forces and their effects, while acting upon the bodies at rest.

DYNAMICS

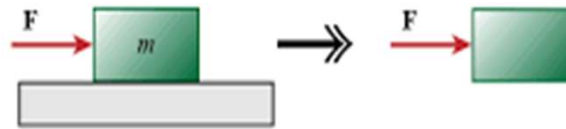
It is that branch of Engineering Mechanics, which deals with the forces and their effects, while acting upon the bodies in motion. The subject of Dynamics may be further sub-divided into the following two branches :

- i. Kinetics, and
- ii. Kinematics.

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KINETICS

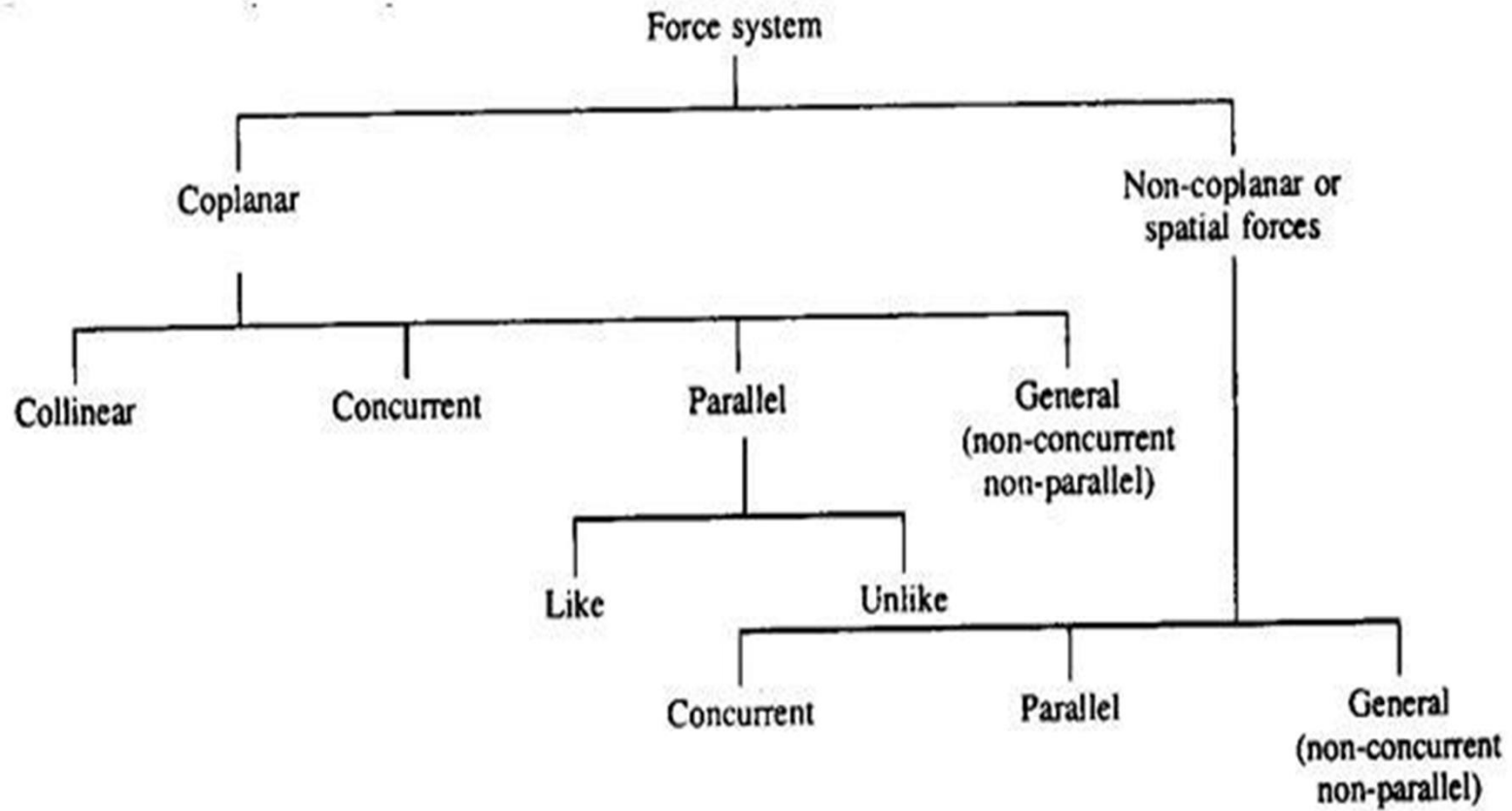
It is the branch of Dynamics, which deals with the bodies in motion due to the application of forces.




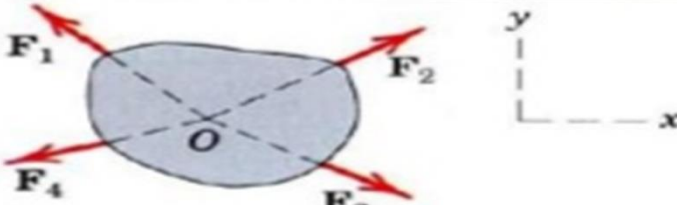

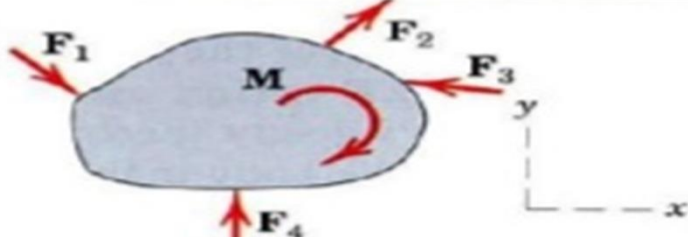
KINEMATICS

It is that branch of Dynamics, which deals with the bodies in motion, without any reference to the forces which are responsible for the motion.

Types of force



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1. Collinear	 A diagram showing a blue irregularly shaped body with three red arrows representing forces F_1 , F_2 , and F_3 . The arrows are all aligned along a dashed line labeled x . F_1 points to the right, F_2 points to the left, and F_3 points to the right.
2. Concurrent at a point	 A diagram showing a blue irregularly shaped body with four red arrows representing forces F_1 , F_2 , F_3 , and F_4 . All four arrows meet at a central point labeled O . To the right of the body is a coordinate system with a vertical y -axis and a horizontal x -axis.
3. Parallel	 A diagram showing a blue irregularly shaped body with four red arrows representing forces F_1 , F_2 , F_3 , and F_4 . All four arrows are parallel to each other and horizontal. F_1 and F_4 point to the right, while F_2 and F_3 point to the left. To the right of the body is a coordinate system with a vertical y -axis and a horizontal x -axis.
4. General	 A diagram showing a blue irregularly shaped body with four red arrows representing forces F_1 , F_2 , F_3 , and F_4 . F_1 points down and to the left, F_2 points up and to the right, F_3 points down and to the right, and F_4 points up. A red curved arrow indicates a clockwise moment about a point labeled M . To the right of the body is a coordinate system with a vertical y -axis and a horizontal x -axis.