

Law of Mechanics in Applied Mechanics

The Branch of Engineering Mechanics which deals with the study of different laws of mechanics as applied to the solution of Engineering Problems is called Applied Mechanics.

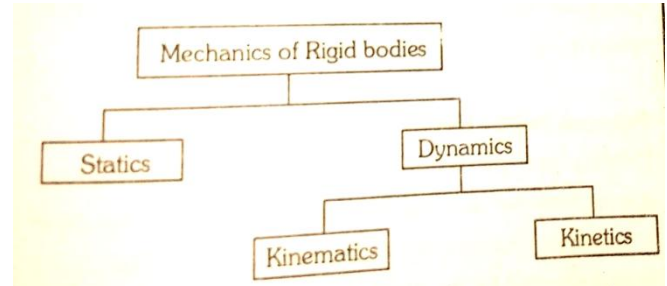
Engineering Mechanics is subdivided into three branches.

- i) Mechanics of Rigid bodies
- ii) Mechanics of Deformable bodies.
- iii) Mechanics of Fluids.

In mechanics of Rigid bodies, deformations are assumed very small and hence neglected. The small deformations does not appreciably affect the conditions of equilibrium. But in actual structure and machines, the deformations are also analysed, that branch of mechanics is called as “Mechanics deformable bodies” (or Mechanics of materials) or strength of materials.

Mechanics of Fluids is the branch of Science which deals with the behavior of fluids, subjected to the action of forces in the state of rest and motion.

Mechanics of Rigid bodies is further classified into two branches, statics and dynamics.

**Statics :**

It is the branch of Science, which deals with the study of a body at rest statics is the study of the equilibrium of bodies under the action of forces, hence, statics is mainly concerned with the conditions of equilibrium of stationary bodies.

Dynamics :

It is the branch of Science which deals with the study of a body in motion. In dynamics, we are mainly concerned with the study of motion of bodies and the effect of forces acting on them.

Kinematics

It is the study of a body in motion without considering the forces, that cause the motion. Kinematics is used to relate displacement, velocity, acceleration, time taken etc. of the bodies without any reference to the cause of motion.

It is the study of a body in motion, with considering the forces, that cause the motion. Kinetics is used to predict the motion of body

caused by given force, or to determine the force required to produce a given motion.

Laws of Mechanics :

The study of Rigid body mechanics is based on the following three laws of Mechanics.

First Law :

A particle remain in its position (rest or motion) if the resultant force acting on the particle is zero.

Second Law :

Acceleration of the particle will be proportional to the resultant force and in the same direction, if the resultant force is not zero.

Third Law :

Action and reaction forces between the interacting bodies are in the same line of action, equal in magnitude, but acts in the opposite direction.

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