

MECHANICS – Introduction

The object of Mechanics may be defined as that science that describe and develop the conditions of equilibrium or of the motion of the material bodies under the action of the forces.

Mechanics can be divided in three large parts, function of the studied object:

- mechanics of the no deformable bodies (mechanics of the rigid bodies);
- mechanics of the deformable bodies (strength of the materials, elasticity);
- fluid mechanics.

Mechanics of the no deformable bodies, or theoretical mechanics, may be divided in other three parts: statics, kinematics and dynamics.

- Statics is that part of the theoretical mechanics which studies the transformation of the systems of forces in other simpler systems and of the conditions of equilibrium of the bodies.
- Kinematics is the part of the theoretical mechanics that deals with the motions of the bodies without to consider their masses and the forces that acts about them, so kinematics studies the motion from geometrical point of view, namely the pure motion.
- Dynamics is the part of the theoretical mechanics which deals with the study of the motion of the bodies considering the masses of them and the forces that acts about them.

In all these definitions the bodies are considered rigid bodies that are the no deformable bodies. It is known that the real bodies are deformable under the action of the forces. But these deformations are generally very small and they produce small effects about the conditions of equilibrium and of the motion.

Mechanics is a science of the nature because it deals with the study of the natural phenomenon. Many consider mechanics as a science joined to the mathematics because it develops its theory based on mathematical proofs.

At the other hands, mechanics is not an abstract science or a pure one, it is an applied science.

Theoretical mechanics studies the simplest form of the motion of the material bodies, namely the mechanical motion. The mechanical motion is defined as that phenomenon in which a body or a part from a body modifies its position with respect to an other body considered as reference system.