

KONSEP MEKANIKA DAN SISTEM SATUAN

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KONSEP MEKANIKA
DAN
SISTEM SATUAN

Contents

What is Mechanics?

Fundamental Concepts

Fundamental Principles

Systems of Units

Method of Problem Solution

Numerical Accuracy

What is Mechanics?

- Mechanics is the science which describes and predicts the conditions of rest or motion of bodies under the action of forces.
- Categories of Mechanics:
 - Rigid bodies
 - *Statics*
 - Dynamics
 - Deformable bodies
 - Fluids
- Mechanics is an applied science - it is not an abstract or pure science but does not have the empiricism found in other engineering sciences.
- Mechanics is the foundation of most engineering sciences and is an indispensable prerequisite to their study.

Mekanika:

Ilmu yang mempelajari dan meramalkan kondisi benda diam atau bergerak akibat pengaruh gaya yang bereaksi pada benda tersebut.

Dibedakan:

1. Mekanika benda tegar (mechanics of rigid bodies)
2. Mekanika benda berubah bentuk (mechanics of deformable)
3. Mekanika fluida (mechanics of fluids)

Mekanika benda tegar:

- Statika : mempelajari benda dalam keadaan diam.
- Dinamika : mempelajari benda dalam keadaan bergerak.

Fundamental Concepts

- *Space* - associated with the notion of the position of a point P given in terms of three coordinates measured from a reference point or origin.
- *Time* - definition of an event requires specification of the time and position at which it occurred.
- *Mass* - used to characterize and compare bodies, e.g., response to earth's gravitational attraction and resistance to changes in translational motion.
- *Force* - represents the action of one body on another. A force is characterized by its point of application, magnitude, and direction, i.e., a force is a vector quantity.

In Newtonian Mechanics, space, time, and mass are absolute concepts, independent of each other. Force, however, is not independent of the other three. The force acting on a body is related to the mass of the body and the variation of its velocity with time.

Units of Measurement

Because of this, the *units* used to measure these quantities cannot ALL be selected arbitrarily



The four basic quantities are NOT all independent from one another. They are related by Newton's second law; $\mathbf{F} = m\mathbf{a}$

