Summary Lecture 6

Dynamics

Newton’s 1st Law:
If the net force on an object is zero, an object originally at rest remains at rest, and an object in motion remains in motion in a straight line with constant speed.

Net force:
\[ \vec{F}_{\text{net}} = \Sigma \vec{F}_{\text{acting on object}} \]

Inertia:
Tendency of a body to resist a change in its state of motion.

Mass:
Measure of the inertia of a body. The unit of mass is the kilogram (kg).
Newton's 2nd Law:
The acceleration of a body is directly proportional to the net force acting on it, and inversely proportional to its mass.

\[ \vec{F}_{\text{net}} = m\vec{a} \]

The direction of the acceleration is in the direction of the applied net force.

Force:
Force is a vector.
Forces are measured in units of Newton (N). 1 N is the force required to accelerate a mass of 1 kg with 1 m/s\(^2\).

\[ 1 \text{ N} = 1 \text{ kg} \text{ m/s}^2 \]