CHAPTER 1

Introduction to Mechanics

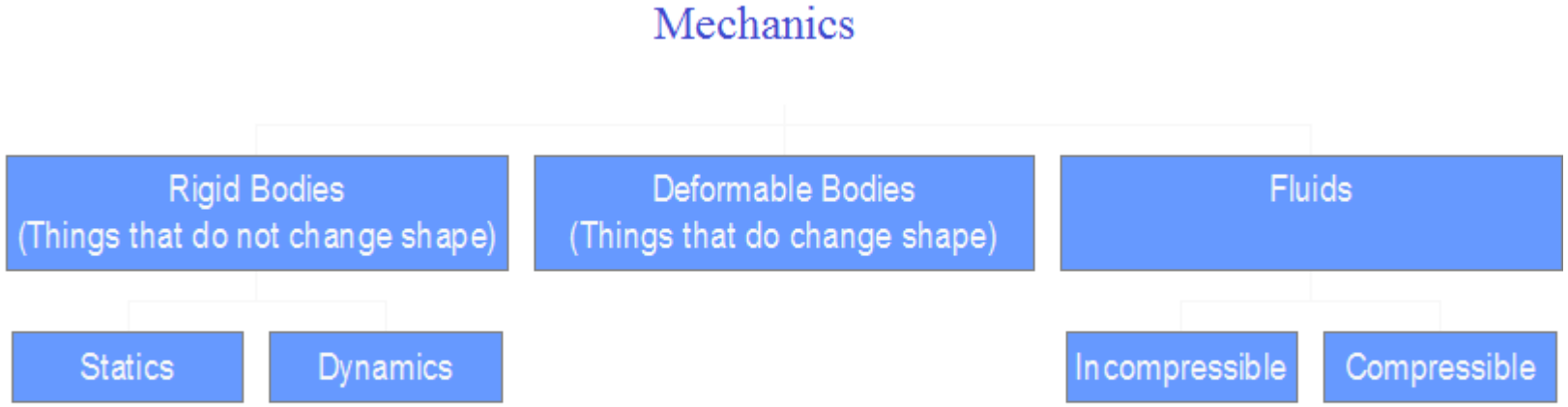
Expected Outcome:

Able to describe the fundamental concepts and principles in engineering mechanics

What is Mechanics?

- Science which describes and predicts the **conditions of rest or motion of bodies** under **the action of forces.**

Branches of mechanics



What may happen if static's is not applied properly?

Important Fundamental Concepts in Mechanics

- *Space* / distance

- *Time*

- *Mass*

- ***Force*** - represents the action of one body on another (represents in form of magnitude and direction)

Fundamental Principles of Newton's Law

- *Newton's First Law*:

If the resultant force on a particle is zero, the particle will remain at rest or continue to move in a straight line.

- *Newton'sSecond Law*:

A particle will have an acceleration proportional to a nonzero resultant applied force.

- *Newton's Third Law*: The forces of action and reaction between two particles have the same magnitude and line of action with opposite sense.

- *Newton's Law of Gravitation*: Two particles are attracted with equal and opposite forces

References:

1. Beer, Ferdinand P.; Johnston, E. Russell; “Vector Mechanics for Engineers - Statics”, 8th Ed., McGraw-Hill, Singapore, 2007.
2. Beer, Ferdinand P.; Johnston, E. Russell; “Vector Mechanics for Engineers - Dynamics”, 8th Ed., McGraw-Hill, Singapore, 2007.