Unit 1A Objectives
Mechanical Energy

Objectives:

- Define the following terms:
  - Distance
  - Displacement
  - Speed
  - Velocity
  - Acceleration
  - Inertia
  - Force
  - Net force
  - Free body diagram
- Explain the implications of the following models
  - constant velocity motion
  - constant acceleration motion
  - Tension
  - Normal force
  - frictional force
- Give real-world examples of the following
  - constant velocity motion
  - constant acceleration motion
- Describe motion using various representations
  - Written or oral description
  - *Position* vs. *time* graph
  - *Velocity* vs. *time* graph
  - Motion map
- Find slope and vertical intercept of a line
- Explain the physical significance of slope and vertical intercept on the following graphs
  - *position* vs. *time*
  - *velocity* vs. *time*
- Determine the following from a *position* vs. *time* graph
  - starting position
  - position at any specified time
  - distance traveled during specified time interval
  - displacement during specified time interval
  - speed at specific time
  - average speed during specified time interval
  - velocity at specific time
  - average velocity during specified time interval
  - sign (+ or -) of acceleration
- Determine the following from a *velocity* vs. *time* graph
  - displacement during specified time interval
  - starting velocity
  - velocity at any specified time
  - acceleration
- Explain significance of intersection of two curves lines on the following graphs
  - *position* vs. *time*
  - *velocity* vs. *time*
- Explain what the area under a *velocity* vs. *time* graph represents
- Articulate the conditions on sign (+ or -) of velocity and sign (+ or -) of acceleration for increasing and decreasing speed
- Solve a variety of qualitative and quantitative problems associated with describing motion
- State and apply Newton's Second Law
- Draw free body diagrams (FBDs) for assorted situations
- Determine resultant (net) force when multiple forces act on a single object