Chapter 6

Saturday, December 5, 2020 8:33 AM

I. 6-1: Work Done by a Constant Force
   a. Work: The product of the magnitude of the displacement times the component of the force parallel to the displacement.
      $W = F_{||}D$
   b. Note: Work for one particular force vs. net force
   c. If force is perpendicular to the displacement, $W = 0$
II. 6-2: Work Done by a Varying Force
   a. The work done by a force F can be calculated by taking the area of the graph
III. 6-3: Kinetic Energy, and the Work-Energy Principle
   a. Kinetic Energy: The energy of motion
   b. Translational Kinetic Energy: $KE = \frac{1}{2}mv^2$
   c. Net Work: The change in the object's kinetic energy
      $W_{net} = \Delta KE$
IV. 6-4: Potential Energy
   a. Gravitational Potential Energy: $PE_{grav} = mgy$
   b. Elastic Potential Energy: $PE_{elastic} = \frac{1}{2}kx^2$
   c. Elastic Force $F_s = kx$
V. 6-5: Conservative and Nonconservative Forces
   a. $W_{01} = \Delta KE + \Delta PE$
VI. 6-6: Mechanical Energy and Its Conservation
   a. The principle of conservation of mechanical energy: If only conservative forces are acting, the total mechanical energy of a system neither increases nor decreases in any process. It stays constant - it is conserved
VII. 6-10: Power
   a. Power: The rate at which work is done
      $P = \frac{W}{t}$
   b. Efficiency:
      $E = \frac{P_{out}}{P_{in}}$