Chapter 5

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I. 5-1: Kinematics of Uniform Circular Motion
   a. Uniform Circular Motion: When an object moves in a circle with a constant velocity
      i. Magnitude of Velocity (i.e. Speed) remains constant
      ii. Direction changes; the object is accelerating
   b. Finding Centripetal Acceleration:
      $a_c = \frac{v^2}{r}$
      i. Velocity is proportional to Acceleration
      ii. Radius is inversely proportional to acceleration
   c. Time Required for 1 revolution: ($f =$ RPS)
      $T = \frac{1}{f}$
   d. Velocity for 1 revolution:
      $v = \frac{d}{t}(C = 2\pi r)$
II. 5-2: Dynamics of Uniform Circular Motion
   a. Finding Centripetal Force:
      $F_c = ma_c = m\frac{v^2}{r}$
III. 5-6: Newton's Law of Universal Gravitation
   a. Gravitational Force is always Equal to the opposing
   b. Law: Every particle in the universe attracts every other particle with a force that is proportional to the product of their masses and inversely proportional to the square of the distances between them. This force acts along the line joining the two particles
   c. Magnitude of Gravitation Force:
      $F = G\frac{m_1 m_2}{r^2}$
IV. 5-9: Kepler's Laws of and Newton's Synthesis
   a. First Law: The path of each planet about the Sun is an ellipse with the Sun at one focus
   b. Second Law: Each planet moves so that an imaginary line drawn from the Sun to the planet sweeps out equal areas in equal periods of time
   c. Third Law: The ratio of the squares of the periods T of any two planets revolving about the Sun is equal to the ratio of the cubes of their mean distances s from the Sun: $\left(\frac{T_1}{T_2}\right)^2 = \left(\frac{s_1}{s_2}\right)^3$