PHYSICS HANDOUT

Motion

$$x = x_0 + v_0 t + \frac{1}{2} a t^2$$

$$v = v_0 + at$$

$$2a(x - x_0) = v^2 - v_0^2$$

Forces

$$\sum F = ma$$

$$F_{Friction} = \mu(F_{normal})$$

$$F_{gravity} = \frac{G m_1 m_2}{R^2}$$

Angular Motion

$$v = r\omega$$

$$a_t = \frac{v^2}{r}$$

$$a = r\alpha$$

$$\omega = \frac{\Delta\theta}{\Delta t}$$

$$\alpha = \frac{\Delta\omega}{\Delta t}$$

$$F_{centripetal} = \frac{mv^2}{r}$$

$$T_{(Period)} = \frac{2\pi}{\omega}$$

Work, Energy and Springs

$$W = Fd\cos(\theta)$$

$$m_i v_i = m_f v_f$$

$$p = mv$$

$$E_{total} = KE + U$$

$$KE = \frac{1}{2} m v^2$$

$$U_{gravity} = mgh$$

$$\tau = Fr\sin(\theta)$$

$$F_{spring} = -kx$$

$$T_{spring} = \frac{1}{2\pi}\sqrt{\frac{m}{k}}$$

Constants

$$g = 9.8 {}^{m}/_{s^2}$$

$$G = 6.67408 * 10^{-11} {}^{m^3}/_{kgs^2}$$