

# PHYSICS HANDOUT

Motion	Forces
$x = x_0 + v_0t + \frac{1}{2}at^2$ $v = v_0 + at$ $2a(x - x_0) = v^2 - v_0^2$	$\sum F = ma$ $F_{Friction} = \mu(F_{normal})$ $F_{gravity} = \frac{Gm_1m_2}{R^2}$
Angular Motion	Work, Energy and Springs
$v = r\omega$ $a_t = \frac{v^2}{r}$ $a = r\alpha$ $\omega = \frac{\Delta\theta}{\Delta t}$ $\alpha = \frac{\Delta\omega}{\Delta t}$ $F_{centripetal} = \frac{mv^2}{r}$ $T_{(Period)} = \frac{2\pi}{\omega}$	$W = Fd\cos(\theta)$ $m_i v_i = m_f v_f$ $p = mv$ $E_{total} = KE + U$ $KE = \frac{1}{2}mv^2$ $U_{gravity} = mgh$ $\tau = Fr\sin(\theta)$ $F_{spring} = -kx$ $T_{spring} = \frac{1}{2\pi}\sqrt{\frac{m}{k}}$
Constants	
$g = 9.8m/s^2$ $G = 6.67408 * 10^{-11} m^3/kg s^2$	

