Summary of WE for particles.

WE principle: $T_1 + V_1 + W^{NC}_{1-2} = T_2 + V_2$

Kinetic Energy

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

Potential Energy

$V_{sp} = \frac{1}{2} k (L - L_o)^2$, where L_o = unstretched length

Δ^2

$V_g = mgh$, where h is the difference in height as defined by a datum.

Work done by NC forces

$$U^{NC}_{1-2} = \int_1^2 \vec{R} \cdot \hat{e}_t \, ds \Rightarrow$$ For example along x

$$U^{NC}_{1-2} = \int_1^2 F_x \, dx$$

* Work is (+) when the Force is in the direction of motion

if Forces are constant

$$U^{NC}_{1-2} = F_x \cdot \Delta x$$