Parallels between energy and momentum (calculus-based physics)

Impulse and momentum	Work and energy
$\vec{\mathbf{p}} := m\vec{\mathbf{v}}$	$K := \frac{1}{2}mv^2$
$\mathrm{d}\vec{\mathbf{J}}_\mathrm{F} := \vec{\mathbf{F}}\mathrm{d}t$ $\quad \int_{t=t_i}^{t=t_f} \mathrm{d}\vec{\mathbf{J}}_\mathrm{F} = \Delta\vec{\mathbf{J}}_\mathrm{F}$	$\mathrm{d}W_\mathrm{F} := \vec{\mathbf{F}} \cdot \mathrm{d}\vec{\boldsymbol{\ell}} = F_\parallel \mathrm{d}\ell = (F\cos\theta)\mathrm{d}\ell$ $\quad \int_{\vec{\mathbf{r}}=\vec{\mathbf{r}}_i}^{\vec{\mathbf{r}}=\vec{\mathbf{r}}_f} \mathrm{d}W_\mathrm{F} = \Delta W_\mathrm{F}$ $\quad [W] = \mathrm{N}\cdot\mathrm{m} = \mathrm{J}$
$\vec{\mathbf{p}}_i + \overbrace{\sum_\mathrm{F} \Delta\vec{\mathbf{J}}_\mathrm{F}}^{\Delta\vec{\mathbf{J}}_{\Sigma\vec{\mathbf{F}}}} = \vec{\mathbf{p}}_f$	$K_i + \sum_\mathrm{F} \Delta W_\mathrm{F} = K_f$ If system has no internal degrees of freedom, $\sum_\mathrm{F} \Delta W_\mathrm{F} = \Delta W_{\Sigma\vec{\mathbf{F}}}$.
$\vec{\mathbf{F}} = \frac{\mathrm{d}\vec{\mathbf{J}}_\mathrm{F}}{\mathrm{d}t} = \frac{\mathrm{d}\vec{\mathbf{p}}_\mathrm{F}}{\mathrm{d}t}$	$P_\mathrm{F} := \frac{\mathrm{d}W_\mathrm{F}}{\mathrm{d}t}$ $\quad P_\mathrm{F} = \vec{\mathbf{F}}\cdot\vec{\mathbf{v}} = (F\cos\theta)v$ $\quad [P] = \frac{\mathrm{J}}{\mathrm{s}} = \mathrm{W}$
	$-\Delta U_{\mathrm{F},1\ldots N} := \Delta W_{\mathrm{F},2\to1} + \Delta W_{\mathrm{F},1\to2} + \cdots + \Delta W_{\mathrm{F},N-1\to N}$ $F_x = -\frac{\mathrm{d}U_\mathrm{F}}{\mathrm{d}x}$ $\quad \Delta U_\mathrm{G} = mg\Delta h$ $\quad \Delta U_\mathrm{S} = \frac{1}{2}k(\Delta x)^2$
$\Sigma\vec{\mathbf{p}}_i + \overbrace{\sum_{\mathrm{EXT}\to\mathrm{SYS}} \Delta\vec{\mathbf{J}}_\mathrm{F}}^{\Delta\vec{\mathbf{J}}_{\Sigma\vec{\mathbf{F}},\mathrm{EXT}\to\mathrm{SYS}}} = \Sigma\vec{\mathbf{p}}_f$	$\overbrace{\Sigma K_i + \Sigma U_{\mathrm{G},i} + \Sigma U_{\mathrm{S},i}}^{ME_{\mathrm{SYS},i}} + \Sigma\Delta W_\mathrm{OUF} = \overbrace{\Sigma K_f + \Sigma U_{\mathrm{G},f} + \Sigma U_{\mathrm{S},f}}^{ME_{\mathrm{SYS},f}} + \Sigma\Delta U_\mathrm{INT}$