$$x(t) = t^2 u(t)$$

since $$t\,u(t) = \int_0^t u(t)\,dt$$

and $$\frac{1}{2}t^2 u(t) = \int_0^t t\,u(t)$$

By integration theorem

$$\mathcal{L}\left\{\frac{1}{2}t^2 u(t)\right\} = \frac{1}{s}\cdot\frac{1}{s}\cdot\frac{1}{s} = \frac{1}{s^3}$$

thus

$$\mathcal{L}\left\{t^2 u(t)\right\} = \frac{2}{s^3}$$