Algorithm 1 Generalized Integral Transformation

Require: Input function $f(t)$.

Ensure: Transformed function $F(s)$ or $F(\omega)$, depending on the specific transformation.

1: **function** INTEGRALTRANSFORM($f(t)$)
2:     Initialize the transformed function $F(s)$ or $F(\omega)$.
3:     Define the transformation kernel or integral expression depending on the specific transformation (e.g., Fourier or Laplace).
4:     Perform the integral transformation:
5:     $F(s) = \int_{-\infty}^{\infty} f(t) \cdot K(s,t)\, dt$ ▷ For example, Laplace Transform
6:     or
7:     $F(\omega) = \int_{-\infty}^{\infty} f(t) \cdot e^{-i\omega t}\, dt$ ▷ For example, Fourier Transform
8: **end function**