Algorithm 1 Generalized Integral Transformation

Require: Input function $f(t)$.

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

function IntegralTransform($f(t)$)

    Initialize the transformed function $F(s)$ or $F(\omega)$.

    Define the transformation kernel or integral expression depending on the specific transformation (e.g., Fourier or Laplace).

    Perform the integral transformation:

    $F(s) = \int_{-\infty}^{\infty} f(t) \cdot K(s,t)\, dt$ ▷ For example, Laplace Transform

    or

    $F(\omega) = \int_{-\infty}^{\infty} f(t) \cdot e^{-i\omega t}\, dt$ ▷ For example, Fourier Transform

end function