Definition (Kernel):
Consider a bounded function $K(.)$ such that $\int K(\psi)\mathrm{d}\psi = 1$.

Assumption Density Estimation I:
$K(.)$ is a bounded, symmetric around 0 function satisfying:

$$\int K(\psi)\mathrm{d}\psi = 1 \tag{1}$$

$$\int \psi^2 K(\psi)\mathrm{d}\psi = \mu_2 \neq 0 \tag{2}$$

$$\int K^2(\psi)\mathrm{d}\psi = c < \infty \tag{3}$$

Assumption Density Estimation II:
The observations $x_1, \ldots, x_i, \ldots, x_n$ are iid over i.

Assumption Density Estimation III:
f is three times continuously differentiable with bounded third derivatives.

Assumption Density Estimation IV:
As $n \to \infty$ and $h \to 0$, $nh \to \infty$.

Assumption Density Estimation I':
Let $K(.)$ be a symmetric, continous, bounded function, such that:

$$\int \psi^k K(\psi)\mathrm{d}\psi = \begin{cases} 1 & \text{if } k = 0 \\ 0 & \text{if } k = 1, \ldots, r-1 \\ \mu_r < \infty & \text{if } k = r \end{cases} \tag{4}$$

Assumption Density Estimation III':
f is $r + 1$ th order continuously differentiable with bounded derivatives.