Definition 0.0.1 (standard Brownian motion)**.** A real-valued process $W = (W_t)_{t\in[0,T]}$, with $W_0 = 0$, defined on a filtered probability space $(\Omega, \mathcal{F}, \mathbb{P})$, is called a standard $\mathcal{F}$-Brownian motion if:

1. W is $\mathcal{F}$-adapted.
2. For any $0 \le u \le t \le T$, $W_t - W_u$ is independent of $\mathcal{F}_u$.
3. For any $0 \le u \le t \le T$, $W_t - W_u \sim \mathcal{N}(0, t-u)$.
4. W is sample-paths continuous, i.e. almost all sample paths of W are continuous.