abstract

Differential equations are viewed as models for the trajectories of moving particles. Using differential equations to study the trajectory of a particle undergoing random mo- tion is not straight forward. The aim of the project is to understand diffusion processes, which are used as models for the trajectory of particle exhibiting a random behaviour. The analysis behind defining stochastic integration and the use of Itˆo's formula in writing the stochastic differential equations is rigorously reproduced. The solutions of the SDEs and the sufficient conditions for their existence and uniqueness are studied, the analysis is supplemented with important examples and applications.