Math 601

# Introduction to Stochastic Differential equations

# and

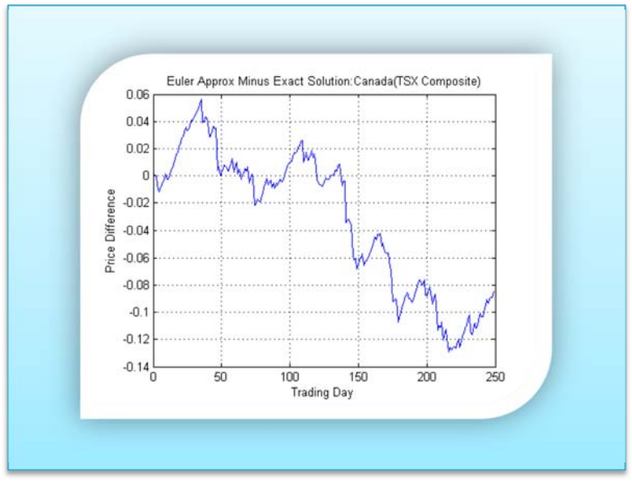
# applications

By : Dr. *Boubaker Smii*

❖ ***Course Description:***

**Probability spaces, Characteristic functions, stochastic processes, martingales, Markov Chains, Brownian motion, Itô integral, Itô formula, Stochastic differential equations, Applications of stochastic differential equations.**

**During this course you will explore the fundamental concepts and fascinating applications of Stochastic Differential equations . Applications to practical situations in environmental and petroleum engineering will be also discussed. For example, estimation of pollution levels in air, water and oil, as well as the characterization of petroleum reservoir, are appropriately handled in a probabilistic context and in many cases they are modeled by stochastic differential equations.**

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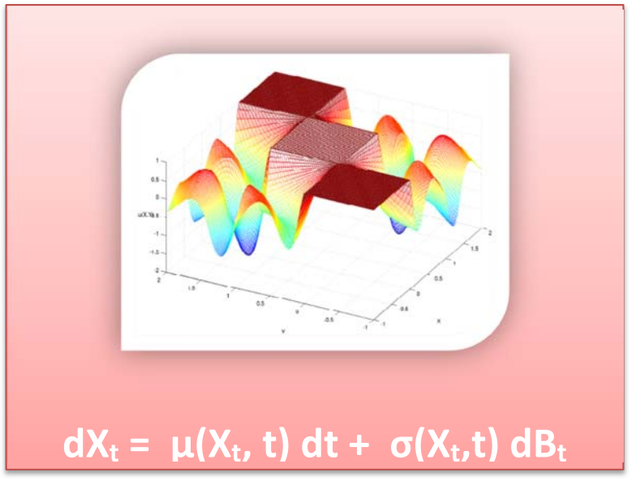

$$dX_t = \mu(X_t, t)\,dt + \sigma(X_t, t)\,dB_t$$