FINANCIAL ENGINEERING WITH STOCHASTIC CALCULUS
ORIE 568

FALL 2006
TU/TH 8:40-9:55AM, HOLLISTER (HO) 206

Email: sashastoikov@gmail.com Office hours: W 4-6pm or by appointment.
Class web page on: http://www.blackboard.cornell.edu

Teaching Assistants:
• Ilya Sheynzon. Section 1: W 2:55-4:25pm in HO 401. Section 2: Th 2:55-4:25pm in HO 401. Office hours: Tu 4:30-5:30pm and on W/Th after sections(15-20 min). Email: ias7@cornell.edu
• Siobhan McCabe. Email: mccabe.siobhan@gmail.com

Content: This course provides an introduction to continuous-time models of financial engineering and the mathematical tools behind them. Starting with Brownian motion as a fundamental building stone in the theory of stochastic processes, the course develops a practical knowledge of stochastic calculus, covering topics including Ito integrals, Ito’s lemma, the Girsanov transform and the Feynman-Kac formula. These methods are applied to the pricing and hedging of derivative securities in complete financial markets. In addition we discuss absence of arbitrage, incomplete markets and the fundamental theorems of asset pricing theory.

Prerequisites: A good knowledge of elementary probability theory is required (ORIE 360). This includes random variables, probability distributions, density functions, expectation and variance, and multidimensional random variables. Background knowledge on stochastic processes will be helpful, but is not required.

Grading: There will be 6-7 homework sets worth 50% of your grade. You may collaborate with other students, but everyone must hand in their solutions individually. There will be a mid exam worth 20% of your grade and a final worth 30% of your grade.

Text Book: Steven Shreve: Stochastic Calculus for Finance 2 - Continuous-Time Models