Instructor: Professor Kao, 110 Eggers Hall, 443-5762, email: cdkao@maxwell.syr.edu

Time and Location: CH101, TTh 2:00-3:20pm

Office Hours: MW 3-4

TA: Yingying Hao, yhao04@syr.edu

Office Hours: tba

Course Description

The course will be mainly based on Shreve (2004). You have to have Ecn521/Ecn522 or equivalent in order to take this course. Please do not take this course if you do not have proper mathematics/statistics/econometrics background. This first part of the course is an introduction to stochastic calculus based on Brownian motion. Topics include: Brownian motion, martingales, the Ito integral; Ito calculus; stochastic differential equations (SDE), Girsanov’s theorem; martingale representation; the Feynman-Kac formula. The second part of the course provides students with the foundations of interest rate concepts and models for the purpose of pricing interest rate derivatives. It covers term structure models that are based on short and forward rate. A number of well known models (e.g. Ho-Lee, Heath-Jarrow-Morton, Vasicek, Hull-White and Black-Karasinski) will be studied. LIBOR market models will also be discussed.

Reading List

The main references used in the course are


Grading: There will be three exams (30%), weekly quizzes (30%) and problem sets (40%).

Course Outline


Brownian Motion: S, Chapter 3; W, Chapter 1

Stochastic Calculus: S, Chapter 4; F, Chapter 4; W, Chapter 1

Risk-Neutral Pricing: S, Chapter 5; W, Chapter 2

Partial Differential Equations: S, Chapter 6

Short Rate Models: S, Chapter 6; F, Chapter 5; W, Chapter 3

Short Rate Model Implementation; W, Chapter 5

Heath-Jarrow-Morton (HJM) Model: S, Chapter 10; F, Chapter 6; W, Chapter 4

Forward Measures: S, Chapter 9; F, Chapter 7; W, Chapter 4

Market Models: S, Chapter 10; F, Chapter 11; W, Chapter 6

LIBOR Market Model Implementation: W, Chapter 7

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. See http://academicintegrity.syr.edu

Disability Statement: Students who may need academic accommodations due to a disability are encouraged to discuss their needs with me asap. Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498.