Math 286, Stochastic Differential Equations, Fall 2010

Lectures:	2:00-3:00 PM, Mondays, Wednesdays, and Fridays in APM 7421
Instructor:	Jason Schweinsberg (jschwein@math.ucsd.edu)
Office:	6157 Applied Physics and Mathematics (534-6949)
Office Hours:	3:00 PM - 4:00 PM on Mondays 11:00 AM - 12:00 PM on Tuesdays other times by appointment
Textbook:	K. Chung and R. Williams. *Introduction to Stochastic Integration*. 2nd ed. Birkhäuser, 1990.
Course Web Page:	http://www.math.ucsd.edu/~jschwein/286.html (or go to http://www.math.ucsd.edu and click on "Course Web Sites")
Prerequisites:	Math 280AB or equivalent

Overview of the course: This course will provide a rigorous introduction to the theory of stochastic integration and stochastic differential equations. We will begin by giving a detailed construction of the stochastic integral with respect to a continuous local martingale. We will then discuss Itô's Formula, which is an important tool for working with stochastic integrals. We will conclude the course with a discussion of stochastic differential equations, focusing on questions of existence and uniqueness. The prerequisites for the course are measure-theoretic probability at the level of Math 280A and martingale theory as taught in Math 280B.

References: The following books will be on reserve in the Science and Engineering Library:

K. Chung and R. Williams. *Introduction to Stochastic Integration*. 2nd ed. Birkhäuser, 1990.

R. Durrett. *Stochastic Calculus: A Practical Introduction*. CRC Press, 1996.

I. Karatzas and S. Shreve. *Brownian Motion and Stochastic Calculus*. 2nd ed. Springer, 1991.

B. Oksendal. *Stochastic Differential Equations: An Introduction with Applications*. 6th ed. Springer, 2003.

The first of these books is the course textbook, while the others are alternative references. The book by Durrett and the book by Karatzas and Shreve cover more topics than the book by Chung and Williams. The book by Oksendal contains more discussion of applications than the others.

Homework: There will be weekly homework assignments, usually due on Wednesdays. Late homework will not be accepted. You are permitted to consult the instructor or other students while working on the homework, but you must acknowledge this help by making a note on your homework. Also, you should write your final solutions independently and may not copy homework from other students or any other source.

Grading Policy: Your course grade will be based on your performance on the homework assignments. There will not be a final exam.