Math 571: Financial Mathematics I Fall 2012 WPI

Instructor: Marcel Blais
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Office Hours:
M 3:30pm – 4:00pm
T 2:00pm – 3:00pm
W 3:30pm – 4:00pm
By Appointment

Class Info: Section 1: Wednesday, 5:30pm – 8:20pm, Stratton Hall 106
Section 2: Monday & Wednesday, 2:00pm – 3:20pm, Olin Hall 126
myWpi will be used to manage many of the course details.

Text: *Stochastic Calculus for Finance II: Continuous-Time Models*, by Steven Shreve, ISBN 0-387-40101-6

Overview: The goal of this course is to become familiar with the basics of the mathematics that underlie mathematical finance theory and financial engineering. Topics include derivative securities (options), binomial stock price models, measure-theoretic probability, Lebesgue integration, conditional expectation, martingales, random walks, Brownian motion & geometric Brownian motion, stochastic differential equations, Ito's formula, the Black-Scholes-Merton PDE, no-arbitrage and risk-neutral option pricing, The Fundamental Theorems of Asset Pricing, hedging, forward and futures contracts, sensitivity measures ("the Greeks"), & implied volatility.

Grading: The final grades will be computed using:

HW	45%
Midterm Exam	25%
Final Exam	30%

Computing: Some assignments will require computing resources. MATLAB and Microsoft Excel will be used.

Exams:
10/10/2012 Midterm Exam, **5:30pm**, SH 106
12/12/2012 Final Exam, **5:30pm**, SH 106

Homework: There will be weekly homework assignments. Typically they will be posted on the course website on Thursdays. In general you are allowed to work together on homework assignments, but your solutions must be written up independently.

Make-up Exam Policy:

Make-up exams will only be allowed in the event of a documented emergency or a WPI club or sport related formal activity that is brought to my attention at the beginning of the course. You are responsible for avoiding conflicts with the exams. Do not plan to leave campus for the term before the final exam.

Late HW:

Late assignments without prior consent of the professor will not be accepted and will receive a grade of 0. Extensions will be granted only in the event of unforeseen emergencies or extenuating situations that you discuss with the professor in advance.

Additional Resources:

- *Stochastic Calculus for Finance I: Discrete-Time Models*, by Steven Shreve.
- *Derivative Securities, Second Edition,* by Robert Jarrow & Stuart Turnbull.
- *Essentials of Stochastic Processes,* by Rick Durrett.
- *The Mathematics of Financial Derivatives: A Student Introduction,* by Paul Wilmott, Sam Howison, & Jeff Dewynne.
- *Financial Calculus: An Introduction to Derivative Pricing*, by Martin Baxter and Andrew Rennie.
- *Options, Futures, and Other Derivatives, 7thEdition*, by John C. Hull.
- Matlab materials: http://www.cs.cornell.edu/courses/cs99/2003su/

Academic Honesty:

WPI has an established academic honor code, described in *The WPI Student Judicial Policies and Procedures*. Each student is expected to familiarize him/herself with WPI's Academic Honesty policies, which can be found at http://www.wpi.edu/offices/policies/honesty.
All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see Prof. Blais.

Disability Services:

If you need course adaptations or accommodations because of a disability, or if you have medical information to share with me, please make an appointment as soon as possible. If you have not already done so, students with disabilities, who believe that they may need accommodations in this class, are encouraged to contact the Disability Services Office (DSO), as soon as possible to ensure that such accommodations are implemented in a timely fashion. The DSO is located in the Student Development Center, its phone number is (508) 831-4908, and its email is dso@wpi.edu.

This syllabus is subject to change at the instructor's discretion