STAT 473: Introduction to arbitrage-free pricing of financial derivatives  
Spring 2015, Purdue University

• General Information  
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Office Hours: Tuesdays 9:00-10:00, Thursdays 3:00-4:00, or by appointment  
Lectures: TTh 1:30-2:45 in REC 309  
Weishaus, ASM Study Manual for Exam MFE-Financial Economics  
Course web site: www.stat.purdue.edu/~figueroa/STAT473.html

• Course Description. This course covers a variety of fundamental results related to arbitrage-free pricing and hedging of derivatives in the Binomial and the Black-Scholes Market Models, including a basic introduction to Brownian motion and Itô formula. This course stresses financial intuition by extensively exploiting the concepts of hedging and arbitrage.

• Homework. Homework will be due roughly every week-and-a-half. Homework will be due at the beginning of class and no homework will be accepted past the due date. The lowest homework score will be dropped. You are encouraged to discuss the assignments with other students but you must write up your homework independently; almost identical solutions are NOT acceptable. See note below about plagiarism⁶.

• Quizzes. 10-minute quizzes will test your understanding of homework assignments. Quizzes cannot be made up under any circumstances, but your lowest quiz score will be dropped.

• Exams.  
  – Two exams will be given during the semester. Exam’s dates will be announced later during the semester. Make-up exams (due to valid justifications) will be given only under prior consent of the instructor.  
  – There will be a comprehensive final exam.

All exams will be closed-book and closed-notes. The only calculators permitted will be those allowed to be used on the SOA examinations.

• Tentative Final Score Weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>17%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>13%</td>
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<tr>
<td>Exam 1 &amp; 2</td>
<td>20% each</td>
</tr>
<tr>
<td>Final</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
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</tbody>
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• Tentative Outline of Course Topics
The following list of topics from McDonald’s book on Derivative Markets corresponds approximately to the requirements given on the Society of Actuaries website for the MFE exam (financial economics):

  – Options and parity relationship between options: Chapter 9 (see background info. in 2.1-2.3).
  – Option Pricing under the Binomial model: Chapters 10 & 11.
  – Option Pricing under the Black-Scholes model: Chapters 12 & 13, 14.
  – Black Scholes theory with Brownian motion and Itô calculus: Chapters 20, 21, & 22.
  – Risk-neutral option pricing and Monte Carlo valuation: Chapters 19.
  – Stochastic interest rates and Stochastic Volatility: Chapters 24, 23.

• Academic Adjustments
Students who have been certified by the Office of the Dean of Students – Adaptive Programs as eligible for academic adjustments should go to MATH 242 and request an Information Sheet.

• Attendance
Attendance is mandatory and students are responsible for any material and information covered during lectures. Extra points for students with very good attendance will be granted through the semester at the instructor’s discretion.

• Regrading Policy
Requests for regrading homework, quizzes, and exams will only be considered within two weeks after these have been returned to students.

⁶Plagiarism is the act of presenting someone else’s work as your own. This includes finding the answer to a given problem in a book, in someone else’s assignment, or requesting the answer from someone, and copying from it. Contrary to popular belief, a complete correct solution to a given mathematical problem is almost never unique, and plagiarism in a mathematical assignment is very easy to detect.