Introduction to Mathematical Finance

Math 589, New Course Proposal

- **Instructor**

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- **Description**

  Based on the binomial asset pricing model, this course introduces students to the basic mathematics used in financial asset pricing. It provides students with background ideas, intuition, and motivation, and prepares students for further study in stochastic calculus in continuous time.

  This is a 3-credit, U/G course, required by the math major financial math option.

- **Prerequisite**

  Mathematics 530 or Statistics 420, or permission of instructor.

- **Text**

  Stochastic Calculus for Finance I: the Binomial Asset Pricing Model
  Steven E. Shreve, Springer 2004

- **Syllabus**

Week 1	No-arbitrage pricing, one-period and multiperiod model
Week 2	Probability review, conditional expectations, martingales
Week 3	Markov processes, change of measure, Radon-Nikodým derivative
Week 4	State prices, capital asset pricing model
Week 5	non-path-dependent American derivatives, stopping times
Week 6	General American derivatives, American call options
Week 7	Random walk, first passage times
Week 8	Reflection principle, perpetual American put
Week 9	Binomial model for interest rates, fixed-income derivatives
Week 10	Forward measures, futures

- **Grade**

  There are two midterms at 100 points each, and a final exam at 200 points. The course grade is based on the total 400 points.

- **Disability Statement**

  Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in f 50 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901;
  `http://www.ods.ohio-state.edu`.

- **Academic Misconduct Statement**

  It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but riot limited to, cases of plagiarism arid dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee. For additional information, see the Code of Student Conduct
  (`http://studentaffairs.osu.edu/resource-csc.asp`).