

ISE 563 FINANCIAL ENGINEERING - Spring 2017

Professor : Cesar Acosta, Ph.D. Office : GER 216 Office hours: Th 5 - 6 p.m. e-mail : acostame@usc.edu	Teaching Assistant: Yushan Li Office : TBA Office hours : By appointment e-mail : yushanl@usc.edu
---	---

Textbook Introduction to the Economics and Mathematics of Financial Markets, Cvitanic J., Zapatero F., MIT Press, 2004.

Pre-requisites: Required, ISE 220 Probability Concepts in Engineering or equivalent. Recommended ISE 460 (or 561) Engineering Economy, or equivalent.

Course Objectives: To familiarize students with investment problems and the mathematical tools needed to solve them. Investment problems such as assets pricing, portfolio selection and optimization, hedging, and optimization of financial strategies. In particular the use of derivative instruments to reduce investments risk. To attain this objective the knowledge of some mathematical tools is required. This course will familiarize the students with stochastic processes and stochastic calculus as they are useful to price derivative assets.

Week	Content	Chapter
1	Introduction	Appendix, notes
2	Portfolio Optimization - single assets lab	5.1
3	Portfolio Optimization - multiple assets lab	5.1
4	Value at Risk lab	5.2
5	Introduction to Derivatives - arbitrage	1.3,1.4
6	Forwards (currency, stock, dividends, index)	6.2
7	Options (European, American), binomial model lab	7.1,7.3
8	Black & Scholes formula lab	7.2.3,7.4
9	Midterm	March 10
10	Black & Scholes differential equation	7.2.2
11	Brownian Motion - Monte Carlo simulation lab	3.3.2,3.3.6
12	Martingales - risk neutral valuation	6.3
13	The Greeks lab	9.3
14	Portfolio hedging lab	9.3
15	Stochastic Calculus	3.3
16	Final Exam	May 5 (4:30 p.m.)

Grading Policy: homework assignments 30%, midterm exam 30%, final exam 40%.

Students with Disabilities. Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776

Desire2learn. Class notes are available at <http://courses.uscden.net/>. For general instructional support assistance please contact the Instructional Support Center office at denisc@usc.edu or (213) 821-1421. For any other technical support issue please contact the Technical Support Center at dentsc@usc.edu or (213) 821-1321.