MW 2:00 – 3:20 p.m., Room OHE 120

Profesor : Cesar Acosta, Ph.D.
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Teaching Assistant: TBD
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Textbook and references

Bennett M., Hugen D., *Financial Analytics with R*, Cambridge, 2016
Hull J., *Options, Futures, and Other Derivatives,* 9th ed., Prentice Hall, 2014

Pre-requisites: Required, ISE 220 Probability Concepts in Engineering 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.

Session	Topic		Chapter
Ago 21,23	Introduction. Volatility of daily returns.	lab	B2,B3
Ago 28,30	Portfolio Optimization	lab	B8
Sep 6	Value at Risk	lab	H22
Sep 11,13	Derivatives. Arbitrage. Forward contracts		H5
Sep 18,20	The Binomial Model	lab	B14
Sep 25,27	Black & Scholes formula	lab	B15
Oct **2,4**	**Midterm Exam**		
Oct 9,11	Brownian Motion.	lab	B15
Oct 16,18	Exotic Options	lab	H14,H15
Oct 23,25	Options on indices, currencies, and dividend paying stocks.		H17,H21
Oct 30	American Options	lab	H21
Nov 1-8	Martingales	lab	notes
Nov 13,15	The Greeks. Portfolio Hedging	lab	H19
Nov 27,29	Stochastic Calculus	lab	notes
Dec 08	**Final Exam**		**2–4 p.m.**

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

Software: *R,* will be the main computational finance tool for portfolio optimization and simulation. Real data will be downloaded, manipulated and analyzed (analytically and graphically) using *R*.

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.