

MW 2:00 - 3:20 p.m., Room OHE 100C

Profesor : Cesar Acosta, Ph.D.
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References

Hull J., *Options, Futures, and Other Derivatives*, 10th ed., Prentice Hall, 2017
 Bennett M., Hugen D., *Financial Analytics with R*, Cambridge, 2016
 Schmuller, *Statistical Analysis with R*, Wiley, 2017

Pre-requisites: ISE 220 Probability Concepts in Engineering

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
Aug 20,22	Introduction. Volatility of daily returns lab	B3.7, H15.4
Aug 27,29	Derivatives. Arbitrage. Forward contracts	H5
Sep 3,5,10	European Options - The Binomial Model lab	B14, H13
Sep 12,17	Black & Scholes formula lab	H21
Sep 19,24	Options on Currency, commodities, futures lab	B15
Sep 26,Oct 1	American Options lab	H17, H21
Oct 3	Midterm Exam	in class
Oct 8,10	Brownian Motion, Monte Carlo simulation lab	B15
Oct 15,17	Stochastic Calculus lab	H14.6, H15.6
Oct 22,24	Exotic Options lab	H26
Oct 29,31	Martingales lab	notes
Nov 5,7	The Greeks. Portfolio Hedging lab	H19
Nov 12,14	Portfolio Optimization lab	notes
Nov 26,28	Value at Risk lab	H22
Dec 7	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. 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 30land 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.uscdcn.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.