F 4:00 – 6:45 p.m., Room OHE 132
Profesor : Cesar Acosta, Ph.D.
Office : GER 216
Office hours: W 4:30-5:30 p.m.
e-mail : acostame@usc.edu

Teaching Assistant: TBD
Office : TBD
Office hours : TBD
e-mail : TBD

**Textbooks - references**
Bennett M., Hugen D., *Financial Analytics with R*, Cambridge, 2016
Hull J., *Options, Futures, and Other Derivatives*, $10^{th}$ ed., Prentice Hall, 2017
**Pre-requisites:** ISE 220 Probability Concepts in Engineering

**Course Objectives:** This course is about investment portfolios that may include derivatives. The focus is on the following topics: optimization of portfolios of risky assets, modeling financial derivatives in discrete and continuous time, pricing derivatives, and, hedging. Overall, the main objective is to measure the risk of investments and to learn how to reduce it.

| Week | Session | | | Chapter |
|---|---|---|---|---|
| 1 | Jan 11 | Introduction. | | B2 |
| 2 | Jan 18 | Volatility of daily returns | lab | B3.7, H15.4 |
| 3 | Jan 25 | Derivatives. Arbitrage. Forward contracts | | H5 |
| 4 | Feb 01 | European Options - The Binomial Model | lab | H13 |
| 5 | Feb 08 | Black & Scholes formula | lab | H21 |
| 6 | Feb 15 | Options on Currency, commodities, futures | lab | B15 |
| 7 | Feb 22 | Implied Volatility | lab | H17, H21 |
| 8 | Mar 01 | American Options | lab | B15 |
| **9** | **Mar 8** | **Midterm Exam** | | **4:00 p.m.** |
| 10 | Mar 22 | Brownian Motion, Monte Carlo simulation | lab | B15 |
| 11 | Mar 29 | Stochastic Calculus | lab | H14.6, H15.6 |
| 12 | Apr 05 | Exotic Options | lab | H26 |
| 13 | Apr 12 | The Greeks | | H19 |
| 14 | Apr 19 | Portfolio Hedging | lab | H19 |
| 15 | Apr 26 | Portfolio Optimization, Value at Risk | lab | H22 |
| **16** | **May 03** | **Final Exam** | | **4:00-6:30 p.m.** |

**Grading Policy:** homework assignments 30%, midterm exam 30%, final exam 40%.
**Software:** *R*, will be the main computational tool.
Real data will be downloaded, manipulated and analyzed with *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.