

ISE 563 FINANCIAL ENGINEERING - Summer 2019 (June 27 – Aug 6)

OHE 100B TTh 11 a.m. - 2 p.m.

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Teaching Assistant: TBD
 Office : GER 242
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Textbooks

Hull J., *Options, Futures, and Other Derivatives*, 10th Ed., Pearson, 2017
 Bennett M., Hugen D., *Financial Analytics with R*, Cambridge, 2016

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

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.

Session	Topic	Chapters and Sections
June 27	Introduction. Volatility of daily returns. lab	H15.4, B2, B3.7
July 02	Derivatives. Arbitrage. Forward contracts lab	H2.11, H5
July 04	European Options	H10.1-10.3, H11.4, H20
July 09	Binomial Model, Black/Scholes formula lab	H13, H17, B15.3
July 11	Implied Volatility lab	H15.11, H20, B15.4
July 16	Midterm Exam	In class
July 18	Brownian Motion lab	H14, B15, B15.1
July 23	Stochastic Calculus	H14.6, H15.5-15.6
July 25	The Greeks lab	H19
July 30	Portfolio Hedging lab	H19
Aug 01	Value at Risk lab	H22
Aug 06	Final Exam	In class

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

Software: R, will be the main computational tool. Current online data will be downloaded, transformed and analyzed using R. It is a powerful open source platform for statistical analysis.

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.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.