

# STAT 449/649: Quantitative Financial Risk Management: Spring 2012 Syllabus

Time: MW 1:00 PM - 2:15 PM  
Location: DCH 1075  
Website: <https://owlspace-ccm.rice.edu/portal/site/STAT-449-001-Sp12>

Instructors: Joseph Egbulefu Prof. John Dobelman  
Contact: Email: joe1@rice.edu Email: dobelman@rice.edu  
Office: DH 2094 Office: DH 2100, Phone: 713 348 5681  
<http://www.stat.rice.edu/~dobelman>

Office hours Tue. 3:00 - 4:00 PM By appointment

Teaching Assistant: Mr. Emilian Vankov, [erv1@stat.rice.edu](mailto:erv1@stat.rice.edu), DH2090, Office Hours: By appointment

Required Texts: 1. Neftci, Salih N., Principles of Financial Engineering, 2nd ed.  
Academic Press, 2008, New York.  
2. Stefanica, Dan, A Primer For The Mathematics Of Financial Engineering  
2nd ed., FE Press, 2011, New York.

Recommended Texts: 1. Taleb, Nicolas Nassim, Dynamic Hedging: Managing Vanilla and Exotic Options  
Wiley Finance, 1997, New York.  
2. Baxter, M. and Rennie, A., Financial Calculus,  
Cambridge University Press, 1996, Cambridge.

Programming Env: **R**: <http://cran.r-project.org>, MS Excel/V Basic  
**R** will be used for exercise solutions and examples.

Grading: 45% 6 assignments  
55% 3 exams  
15% Exam 1: In class Monday. Feb 20, 2012  
15% Exam 2: In class Monday. April 2, 2012  
25% Exam 3: Take home Finals period

## Assignments policy

Six out of class assignments will be given. Assignments will be posted on a Wednesday and will be due a week later. **An assignment is late if it is not submitted in class or via Owl Space by 11:59 PM Central Time on the following Wednesday. Late assignments will not be accepted without an advanced and approved request for late submission.** For programming and data analysis exercises, your humanly interpretable code (when applicable) should be included (as an appendix) to your solution. **In general, if the means to a solution is not clear, full credit will not be given.**

For each student, one of the six assignment which the student earns the lowest score, will be dropped. Students have the option to collaborate on assignments; however, each student is required to write-up

his/her own solution.

## Exams

The two midterms will be taken in class. The Final exam will be conducted in accordance with the registrar's policy on such exams. The out of class final exam will be cumulative.

## STAT 649 vs. STAT 449

For each assignment and exam students in 649 will either have one or two exercises in addition to those assigned to 449 students, or a different set of exercises.

## Tentative schedule

Week	Dates	Topics
	<b>Part I: Pricing Fundamentals</b>	
1	1/9 - 1/13	Fundamental theorem, Present value Portfolio and returns, Static replication
2	1/16 - 1/20	Martingale pricing, Futures/Forwards
3	1/23 - 1/27	Bonds, Yield curve, Convexity
4	1/30 - 2/3	Fundamentals of swap and option pricing
5	2/6 - 2/10	Brownian motion and SDEs
6	2/13 - 2/17	Black-Scholes Equation
7	2/20	Exam 1
	<b>Part II: Derivatives pricing</b>	
7	2/22	Options pricing - Binomial pricing
8	2/26 - 2/29	Spring Break
9	3/5 - 3/9	Options pricing - Continuous time models
10	3/12 - 3/16	Options pricing - Exotic options, Monte Carlo methods
11	3/19 - 3/23	Volatility models
12	3/25 - 3/30	Interest rate models
13	4/2	Exam 2
	<b>Part III: Risk management</b>	
13	4/4	Relevant multivariate time series results
14	4/9 - 4/13	Hedging, Value at Risk
15	4/16 - 4/20	Spreads, Statistical Arbitrage
	4/25 - 5/2	Final Exam

## Disabilities

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me/us during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services in the Ley Student Center. Further information is available at <http://dss.rice.edu/>.