

Financial Engineering, Summer 2010

Simon Benninga

This class concentrates on building financial models for portfolios and options. The classes will be directed towards applying the theory of finance in building implementable models, with Excel and VBA used as a programming vehicle.

**I urge you to bring a laptop to class
If you have a Macintosh—you must be able to run
Microsoft Office in a PC partition
(course does not support the new Macs)**

Book and other materials: We will use chapters from my book *Financial Modeling* (3rd edition, 2008—chapters from this book are indicated by FM3 below). There may additional readings. Chapters and readings will be posted on the course website:

<http://www.tau.ac.il/~benninga/fe2010/fe2010.htm>

The website is password protected.

Prerequisites: I assume that you have a good grounding in accounting, introductory corporate finance, and investments, including portfolio theory and options. You should be comfortable with mathematics.

Grading: Based on a weekly homework (40%) and a final examination (60%). In special cases I will allow you to replace the final examination with a group project.

CLASS SCHEDULE (changes possible)

Week 1	Technical topics: <ul style="list-style-type: none">• Data tables in Excel• Introduction to VBA Portfolio choice <ul style="list-style-type: none">• Introduction• Matrices and multiple-asset portfolios	FM3, Ch. 30: Data tables FM3, Ch. 31: Matrices FM3, Ch. 34: Array functions FM3, Ch. 8: Introduction Adding getformula.doc
Week 2	Constructing efficient portfolios Building variance-covariance matrices	FM3, Ch. 9: Efficient portfolio theorems FM3, Ch. 10: Variance-covariance matrices
Week 3	Testing the CAPM The Black-Litterman model	FM3, Ch. 11: SML testing FM3, Ch. 13: Black-Litterman
Week 4	Options review <ul style="list-style-type: none">• Introduction to options• Option arbitrage propositions• Lognormal distribution and price simulations• Black-Scholes	FM3, Ch. 16: Option introduction FM3, Ch. 18: Lognormal distribution FM3, Ch. 19: Black-Scholes
Week 5	Understanding and simulating portfolio insurance Monte Carlo methods in option pricing	FM3, Ch. 17: Binomial models FM3, Ch. 22: Portfolio insurance FM3: Chapter 23
Week 6	Using Monte Carlo methods to price options	FM3: Chapter 24
Week 7	Skewness and kurtosis in option pricing	Handout