University of Pittsburgh

Joseph M. Katz Graduate School of Business

BFIN 2145 (20593): Financial Modeling

SYLLABUS

Abstract:

The course is an introduction to computation finance and financial econometrics. The emphasis of the course is on making the transition from the theory of financial modeling to the empirical ("heuristic") model using real data. Microsoft Excel is the primary tool to implement the different financial models. These models include but are not limited to asset return calculations, portfolio theory, index models, the capital asset pricing model, option pricing models, bond valuation and investment performance analysis. The course will also make some use of statistics and probability

Instructor:

Marios A. Panayides (Professor or Marios)

***Office Hours**:* Thursdays 1:00-3:00, or by appointment (please, use email to arrange for appointments).

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Teaching Assistant:

Anjana Rajamani (Advanced Ph.D. student in Finance)

***Office Hours**:* Mondays 12:00-2:00, or by appointment (please, use email Anjana to arrange for appointments).

Office: 219 Mervis Hall

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Class Location For Every Class:

201 Mervis Hall (Computer Lab)

The Prerequisites:

Basic Finance and Statistics courses are required: (Financial Management BFIN2006). This course assumes that you understand basic investment analysis, portfolio management, and capital markets. It also expects that you have knowledge of the general principles of asset valuation with application to specific securities. In addition, this course assumes you understand elementary probability, discrete and continuous distributions, hypothesis testing and confidence interval. It is also assumed that you have an understanding of simple, linear regression. Lastly, it is better (but not a necessity) to have some knowledge of calculus and matrix algebra.

The Goals:

In previous finance courses you have learned a wide variety of financial models. The objective of this course is to teach you how to *implement* these models using Microsoft Excel. "*Learning by doing*" is a highly effective way of gaining deeper insights into financial models and their meanings and that is what we are going to do in this class.

By the end of this course, you will have:

- A working knowledge of an electronic spreadsheet (*Microsoft Excel*), which may be used to advance your knowledge of Excel or applied to another electronic spreadsheet.

- A full understanding of the principles of Spreadsheet Design and the ability to create spreadsheet models of financial problems.

- The skills needed to analyze financial problems and identify solutions through the use of an electronic spreadsheet.

The Materials:

Simon Benninga, Financial Modeling **(3rd edition) the** ***MIT Press*** is the required text. I will also have detailed slides in class. Computer instructions for using Excel will also be provided as extra notes. Slides, assignments, extra notes will be posted on Black Board (https://courseweb.pitt.edu/). You may wish to get Microsoft Excel User's Guide to help with Excel and also subscribe to the *Wall Street Journal* or some other newspaper.

Assignment File Protocol:

All assignments should be submitted through the BlackBoard assignment module. From there you will download the assignment file, complete the assignment and upload your completed file in the assignment module's materials section. Your completed assignment

file name must indicate the appropriate assignment number and must include your last name and first name.

For example: **Assignment_1_Doe_John.xlsx**

The Requirements:

Readings: Suggested for each class

Software: We will make extensive use of Excel statistical software. You are required to have a basic working knowledge of Excel, although the finer points of Excel (advanced functions) will be explained along the way.

Homework and Exams: There will be approximately 4 homework assignments based on material in the book and the lecture/lab. All assignments should be submitted through the *BlackBoard assignment module (see above)*. These assignments will constitute 20% of the grade. 15% will be based on class participation. The remaining 65% of the grade is based on a two mid-term exams (15%+15%=30%) and a final exam (35%). Exams are to be taken in the computer lab. You are not allowed to bring any materials (disks, book, etc.) to the exams (You will be provided with any material needed for the exams). Be warned: unless you do the exercises yourself, you will do poorly on the exams!

Grading:

Assignments: 20 %

Midterm Exams: (15%+15%=30%)

Final Exam: 35 %

Class Participation: 15%

Exam Policy

Students are expected to take exams (midterms) at the scheduled times. If a student misses a midterm, the weight of the missing grade will be carried over to the final exam. *It is strongly suggested that students take all midterm exams*. If a student is ill on the date of the final exam, he/she must provide a written note from a physician or from a professional in student health services who has treated him/her on or about the date of the exam. The student must notify me either by e-mail or voice mail prior to the time the exam begins if he/she is ill. Failure to abide by these policies will result in a zero for the missed final.

Other Issues

Academic Integrity: Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy.

Disabilities: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact your instructor and Disability Resources and Services (DRS), 140 William Pitt Union, 412.648.7890/412.383.7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Tentative Course Schedule

(Topics will be *added or subtracted* depending on class interest)

Dates	Subject	Reading Assignment
August 28 and 30 Location: 201 Mervis Hall	Introduction to Financial Modeling Introduction to Excel Functions and Data Tables One Portfolio	Syllabus and Lecture Note Chapters 35, 30 and Lecture Notes Chapter 8
September 4 and 6 Location: 201 Mervis Hall	One Portfolio Hands-on Examples Linear Combinations of two Portfolios	Chapter 8 Class Participation Chapters 10
September 11 and 13 Location: 201 Mervis Hall	Linear Combinations of two Portfolios Hands-on Examples Calculating Efficient Portfolios	Chapters 10, 31 Class Participation Chapter 9
September 18 and 20 Location: 201 Mervis Hall	Calculating Efficient Portfolios Hands-on Examples Estimating Betas and the Security Market Line	**1st Assignment Due** Chapter 9 Chapter 11

September 25 (No Class on the 27th - Professional Development Day) Location: 201 Mervis Hall	Estimating Betas and the Security Market Line Hands-on Examples	Chapter 11 Class Participation
October 2 and 4 Location: 201 Mervis Hall	Introduction to Options Introduction to Options Hands-on Examples	Chapter 16 Chapter 16 Class Participation
October 11 (No Class on the 9th - Fall Break - Monday Classes)	Class Review on Portfolio Theory	**2nd Assignment Due** Chapters 8, 9, 10, 11,16, 30, 31, and Lecture Notes
October 16 Location: 201 Mervis Hall **October 18** **Location: 201 Mervis Hall**	The Black-Scholes Model Hands-on Examples **1stMidterm**	Chapter 19 Class Participation **Chapters 8, 9, 10, 11, 16, 30, 31 and Lecture Notes** **Class Participation**
October 23 and 25 Location: 201 Mervis Hall	Exploring price sensitivities of options with B&S Hands-on Examples The Binomial Option-Pricing Model	Class Participation Chapter 17
October 30 and November 1 Location: 201 Mervis Hall	The Binomial Option-Pricing Model Hands-on Examples Pricing Employees Stock Options	Chapter 17 Class Participation Lecture Notes and Chapter 17 (17.8)
November 6 and 8 Location: 201 Mervis Hall	Pricing Employees Stock Options Hands-on Examples Class Review on Options	**3rd Assignment Due** Lecture Notes and Chapter 17 (17.8) Class Participation Chapters 17, 19 and Lecture Notes
November 13 Location: 201 Mervis Hall **November 15** **Location: 201 Mervis Hall**	Introduction to Bonds-Duration **2nd Midterm**	Chapter 25 **Chapters 17, 19 and Lecture Notes** **Class Participation**
November 20 and 22	No Classes Thanksgiving Break Week	☺
November 27 and 29 Location: 201 Mervis Hall	Duration Hands-on Examples Immunization Strategies	Chapter 25 Class Participation Chapter 26

December 4 and 6 Location: 201 Mervis Hall	Immunization Strategies Hands-on Examples General Review on Financial Modeling	**4th Assignment Due** Chapter 26 Class Participation Chapters 8, 9, 10, 11, 16, 17, 19, 25, 26 and Lecture Notes Class Participation
Tuesday-December 11 Location: 201 Mervis Hall Hours (??)	**Final Exam**	**Class Participation**