

# Syllabus for FINA 584 Financial Modeling

Fall 2009  
Version: 28-Oct-2009



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Hit the “FINA 584” button on the left-hand side  
If you are looking for handouts or files, please check this website

**Classroom:** Cliftons Limited, 33/F, 9 Queens Road Central, MTR “Central” Exit K

**Class Times:** Wednesdays 7:00pm - 10:20pm

**Overview:** This is a course about financial modeling. It covers a range of topics in the field of financial economics. Each topic was chosen because it lends itself to financial modeling. Class meetings are three hours and twenty minutes long. The first 1.5 hours will be spent presenting models and reviewing the current day’s assignment. The second 1.5 hours will be spent introducing the material needed for the following week’s assignment. We cover six different topics:

1. Loan amortization schedules
2. Mutual fund performance and style analysis
3. Optimal portfolio selection
4. TBD: Databases or private equity
5. Fixed income derivatives
6. Equity derivatives

The final class will consist of an exam that is MANDATORY for all students. This is a “hands-on” course that requires students to analyze data and participate in class discussions. Course work is based on recently written cases and current research.

**OBE:** When reading this syllabus, please note that “OBE” refers to outcome based education. By focusing on six topics, we hope this course ensures students have an in-depth grasp of six (key) areas in finance. We hope all assignments help student develop critical thinking and creative decision making skills.

**Modeling:** This course is about financial modeling. The goal is to make financial models that produce useful answers to economic questions. The assignments are designed to be similar to assignments students will encounter in their future jobs. Students may use any software they choose, however only Microsoft Excel is required. All assignments can be completed with Excel. Please see the section labeled “Software” below.

This is not a course in computer programming. The course was redesigned last year and we decided to concentrate on understanding underlying economic issues. Business school graduates can hire computer programmers to help optimize or speed-up numerical calculations.

**Pre-Reqs:** Students must have a basic-to-middle level of competence with Microsoft Excel before starting the course. They should know the difference between absolute and relative references. They should be able to use functions such as NPV, IRR, AVERAGE, STDEV, etc. Finally, students should be able to plot data and run regressions with Excel’s internal functions. For those who feel they do not have sufficient Excel experience, we suggest completing the Excel’s tutorials before the first class meeting.

As this is a rather advanced course, students are strongly advised to have taken all pre-requisite courses. In terms of subject matter, students should be comfortable with equity and fixed-income derivatives, portfolio math, and cost of capital calculations.

**Readings:** This course uses case studies, journal articles, and handouts. Much of the material is posted on the course website. Some journal articles are a bit advanced and should be read (skimmed) for their main ideas rather than for details:

- 1 HBS case
- 1 Journal article
- 2 Privately published articles / working papers
- + Handouts to be posted on class website

The course reader can be picked up at the first class meeting.

**Software:** The professor and teaching assistant use Microsoft Excel 2003. Students are free to complete assignments using any comparable spreadsheet program. Answers and solutions will only be guaranteed to work with Excel 2003.

Students who would like to complete assignments with more advanced software (C++, Java, Matlab, R, R+, S, S+, SAS, VBA, etc.) are encouraged to do so. However, weekly assignments (described below) are still due in an Excel 2003-compatible format.

Grades: Class grades are based on four items: class participation, weekly group assignments, an internal group evaluation, and a final exam. The weight of the final exam is normal for HKUST.

i. Class participation	5.0 %
ii. Weekly group assignments	30.0
iii. Internal group evaluation	15.0
iv. <u>Final exam</u>	<u>50.0</u>
Total	100.0 %

You are responsible for all material covered in class, including assigned readings and exercises. As mentioned above, we cover six different topics in this class. When preparing for the final exam, students should concentrate on the class notes and group projects.

Assignments: Each week, starting in Week #2, students will prepare an assignment before class. During the first meeting, the class will be divided into groups of three to five students (exact size to be determined on the first day). During the remaining classes, each group is responsible for bringing a working Excel model capable of answering assignment questions. The model should also be flexible and capable of answering a host of additional questions such as: “What if the tax rate changes to 38%?” or “What if the loan term is shortened to 6 years?” A modest amount of group work is aimed at the OBE goal of ensuring students are effective team members and leaders.

Also each week, one or more groups will be chosen at random and their financial model will be uploaded to the instructor’s computer. The group will be responsible for presenting answers to the assignment questions. All members of the group will receive the same grade for the presentation work. The presentation requirement is aimed at the OBE goal of ensuring students communicate effectively in English.

Final exam: {Please excuse me, but this policy is not negotiable} As a strict rule, there are no “make-up” final exams. It is your responsibility to schedule the rest of your activities such that you are able to attend the final exam. The final exam in this class is scheduled to take place on Wednesday 16-Dec-2009 from 7:00pm to 10:00pm at Cliftons. All students should plan to take the exam at this time. The weight of the final exam (50%) is normal for courses at HKUST.

Cases and:  
computer codes {The following policy adopted at most top business schools} In the past, students have asked for handouts of the “correct” case analysis after the class has discussed a case. I will not provide such answers for two reasons. First, the best cases are deliberately written to be ambiguous. While there are no right answers, there are good and bad arguments. Handing out my analysis would reduce the ambiguity in the cases and partially defeat the purpose of doing cases. Second, when case analyses are handed out, these answers will eventually reach future students taking the class with probability one. This seriously impedes an open and rewarding case discussion and imposes huge negative externalities both on myself as well as on other people teaching these cases.

## Class Topics and Assignments

All Assignments are Due by the Start Class on the Day Indicated

Note: "OBE" refers to outcome based education. By focusing on six topics, we hope this course ensures students have an in-depth grasp of six (key) areas in finance. We hope all assignments help student develop critical thinking and creative decision making skills.

<b>Wed</b>	<b>28-Oct-2009</b>	1 <sup>st</sup> Half:	Introduction to financial modeling Brief review of Excel Class expectations and syllabus review	(Class #01)
		Readings:	None	
		Prepare:	If needed, please do Excel tutorials before class	
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		2 <sup>nd</sup> Half:	Loan amortization schedules Interest rate conventions Compounding	
		Readings:	Review HBS Case 9-205-008 "Note on Bond Valuation and Returns"	
<b>Wed</b>	<b>04-Nov-2009</b>	1 <sup>st</sup> Half:	Loan amortization schedules Review today's assignment	(Class #02)
		Readings:	HBS Case 9-205-008 "Note on Bond Valuation and Returns"	
		Prepare:	Download and answer loan amortization questions Prepare one (1) flexible and clean model per group	
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		2 <sup>nd</sup> Half:	Mutual fund performance and style analysis Minimizing least squares Constrained regression analysis	
		Readings:	"Asset Allocation: Management Style and Performance Measurement" by Sharpe	
<b>Wed</b>	<b>11-Nov-2009</b>	1 <sup>st</sup> Half:	Mutual fund performance and style analysis Review today's assignment	(Class #03)
		Readings:	"Asset Allocation: Management Style and Performance Measurement" by Sharpe	
		Prepare:	Download and answer mutual fund questions Prepare one (1) model per group	
		OBE:	Use information technology effectively	
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		2 <sup>nd</sup> Half:	Optimal portfolio selection Matrix math Regression analysis with matrix math	
		Readings:	"The Intuition Behind Black-Litterman Model Portfolios" By He and Litterman	

<b>We</b>	<b>18-Nov-2009</b>	1 <sup>st</sup> Half:	Optimal portfolio selection Review today's assignment	(Class #04)
		Readings:	A Step-by-Step Guide to the Black Litterman Model By Thomas M. Idzorek	
		Prepare:	Download and answer portfolio selection questions Prepare one (1) model per group	
		OBE:	Use information technology effectively	
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		2 <sup>nd</sup> Half:	Databases or private equity	
		Readings:	T.B.D.	
<b>We</b>	<b>25-Nov-2009</b>	1 <sup>st</sup> Half:	Databases or private equity Review today's assignment	(Class #05)
		Readings:	T.B.D.	
		Prepare:	Download and answer questions Prepare one (1) model per group	
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		2 <sup>nd</sup> Half:	Fixed income derivatives More difficult optimizations	
		Readings:	T.B.A.	
<b>Tues</b>	<b>12-May-2009</b>	1 <sup>st</sup> Half:	Fixed income derivatives Review today's assignment	(Class #06)
		Readings:	T.B.A.	
		Prepare:	Download and answer fixed income derivative questions Prepare one (1) model per group	
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		2 <sup>nd</sup> Half:	Equity derivatives Monte Carlo simulations Simulation of stock price paths	
		Readings:	Review FINA 529 and 530 class notes Handout on Microsoft Excel and Monte Carlo simulations Handout on the MCSim.xla add-in	

<b>Wed</b>	<b>9-Dec-2009</b>	1 <sup>st</sup> Half:	Equity derivatives Review today's assignment	(Class #07)
		Readings:	Handout on Microsoft Excel and Monte Carlo simulations Handout on the MCSim.xla add-in	
		Prepare:	Download and answer equity derivatives questions Prepare one (1) model per group	
		OBE:	Use information technology effectively	
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		2 <sup>nd</sup> Half:	Prepare for final exam Please bring questions to class	
		Evaluations:	Do online evaluations in class	
		Readings:	None	
<b>Dec</b>	<b>16-Dec-2009</b>	Final Exam		(Final / Class #08)
		Location:	Cliftons Limited	
		Time:	7:00pm to 10:00pm	
		Items:	You may bring one (1) sized A4 sheet of paper with handwritten formulas (both sides OK). There will be no internet connections nor will you have access to other materials.	