

Instructor: Fritz Koger, CFA, PhD

email: fritzkoger@phbs.pku.edu.cn

Office: 752

Office Hours: 13:00 – 14:00, Friday

Course: Financial Modeling

Class Location: 403

Class Meeting Time:

Section 1(Elective): Tuesday and Friday, 10:30 – 12:20.

TA Review Sessions: None

Teaching Assistant: Hikmat Alihonov, 1401213345@sz.pku.edu.cn, 136 6226 2848

Course Goals and Description: This course is intended for the student who wishes to learn how to utilize financial theory in real world applications. The course is practical in nature. Upon completion of the course, the student will be fluent in both Excel as well as financial modeling. Such fluency will position him/her very well for essentially any financial job. The student will also have a nice tool kit of many real world financial models across a very broad range of topics. This combination of fluency of financial modeling and portfolio of models will prove invaluable during both interviews with potential employers as well as execution of finance-related employment tasks.

The professor has two primary goals: arm the student with

- (1) many practical financial Excel models and
- (2) programming knowledge of Excel to develop his/her own models as the need arises in his/her professional and personal life.

An extremely important aspect of these goals is the ability to perform

- (1) sensitivity analyses (i.e., single variable comparative statics) and
- (2) scenario analyses (i.e., simultaneous multi-variable “comparative statics”).

The student will learn proficiency in these valuable methods, e.g., via extensive use of Excel data tables, both one-dimensional (sensitivity analysis) and two-dimensional (scenario analysis).

Broadly speaking, the course covers topics in corporate finance, portfolio management, options and bonds. For a detailed listing of course topics, see the chapter titles of the primary textbook on the ultimate page of this syllabus. We will cover all (approximately) 30 of these chapters!

Lectures will be conducted primarily via three techniques: (1) live Excel exhibitions, where the student builds models simultaneously with the professor, (2) non-live Excel exhibitions, where the professor walks the student through more complex Excel models, and (3) limited white-board demonstrations of associated financial concepts to be subsequently modeled via Excel. As such, each student is required to possess a laptop equipped with Excel.

Financial Modeling is very "hands-on", with most of the grade determined via demonstration of building models via Group (homework) Projects. Group membership will be determined by the students themselves by the third lecture. (The professor is happy to assign groups to those students who prefer not to choose their own group members.) The purpose of group homeworks/projects is to reinforce and to extend the student's knowledge regarding models built during lectures.

The final exam will be easier if you have actively participated in the group projects. Otherwise, the final exam will be quite challenging.

Learning Goals:

- (1) Emphasis is placed on problem-solving and critical thinking. The student will improve his/her understanding of finance principles and more importantly, learn how to apply them to problems beyond those studied in this course.
- (2) The student will further develop skills related to leadership and teamwork. Each student will complete challenging projects in teams, which will also enhance his/her understanding of finance principles and best practices in modeling.

Course Prerequisites: *Asset Valuation Theory (AVT)*. Also, the course will be simpler if the student has previous exposure to Excel and to financial statement analysis. Nonetheless, the first lecture will be used to introduce the basics of Excel, including Excel's basic financial functions. Additionally, the professor will spend a few minutes at the beginning of many lectures reviewing the relevant financial concepts to be modeled that day. However, a student who has NOT completed AVT will not find these brief reviews sufficient. Thus, AVT is a definite prerequisite.

Course Material: Primary Textbooks:

- (1) Simon Benninga, "*Financial Modeling*", 4th Ed., 2014, Massachusetts Institute of Technology, ISBN-13: 860-1401358411; ISBN-10: 0262027283
- (2) Chandan Sengupta, "*Financial Modeling Using Excel and VBA*", 2nd Ed., 2010, Wiley Finance, ISBN-13: 78-0471267683; ISBN-10: 0471267686

Additional References and Supplemental Textbooks:

- Michael Rees, "*Financial Modelling in Practice*", 2008, Wiley Finance, ISBN: 978-0-470-99744-4.
- Mary Jackson and Mike Staunton, "*Advanced Modelling in Finance using Excel and VBA*", 2001, Wiley Finance, ISBN-13: 978-0-471-49922-0.
- John Charnes, "*Financial Modeling with Crystal Ball and Excel*", 2012, Wiley Finance, ISBN 978-1-118-17544-6.
- Simon Benninga, "*Principles of Finance with Excel*", 2006, Oxford University Press, ISBN-13: 978-0-19-530150-2.
- Isaac Gottlieb, "*Next Generation Excel, Modeling in Excel for Analysts and MBAs*", 2010, John Wiley and Sons, ISBN: 978-0-470-82473-3.

Course Guidelines: There are two overarching themes: the professor's aims are to (1) be as fair as possible to everyone, and (2) create the optimal learning environment for everyone! The professor firmly believes that treating individuals differently is inherently unfair. Thus, everyone will be treated the same.

Grading: The student's final grade will be

10% (Professor's Subjective Evaluation)
+ 40% (Average of student's Group Project Scores*)
+ 50% (Individual Final Exam Score).

Group Peers' Subjective Evaluation:** Each student will self-select into groups of five or six students. (The professor will assign any student to a group who chooses not to self-select.) Evaluations from each student's group peers will be done during the final week of the module. ***NO HUMAN BEING OTHER THAN THE PROFESSOR WILL SEE ANY STUDENT'S EVALUATIONS; NOT EVEN THE TAs. These evaluations will factor into the "Average of student's Group Project Scores". So a student who receives his/her proportional weight from his peers' evaluations will have a ***factor of 100%***. A student who receives more than (less than) his/her proportional weight will have a ***factor greater than (less than) 100%***.

FINAL EXAM: If the student has actively participated in all project work, if the student has attended all lectures, if the student has kept up with textbook lecture readings, and if the student has studied carefully the lecture notes provided by the professor, then the final exam will be straightforward. ***Otherwise, the student will struggle with it.***

FINAL EXAM GUIDELINES: Please review carefully the guidelines. ***If the student is uncomfortable with these, then the student should not take this course.*** The professor will grade that which is saved onto his/her USB (thumb) drive. If the student can NOT confidently work quickly and efficiently and save your work afterward, then he/she should NOT take the course. The student who chooses to take the final exam with inferior equipment does so at his own peril.

Professor's Subjective Evaluation: This is based in part, on his/her punctuality, attendance, classroom behavior, attitude, preparedness, etc... Per PHBS policy, if he/she is absent 6 (or more) lectures, then he/she ***automatically fails*** the course. The professor appreciates the student letting him know ***in advance*** if he/she will be tardy or absent. However, this does not excuse an absence. Please note that the number of absences is independent of whether or not they are approved by the University or HSBC Business School. (The professor does ***not*** distinguish between approved or unapproved absences.) Also, the professor does ***not*** sign PHBS forms related to the student's planned absence(s).

To minimize classroom disruptions, the professor strongly urges the student to be punctual. All announcements are made at the beginning of class, making punctuality all the more important.

If you miss a lecture, you are responsible for material covered. ***Secure information missed from a fellow student,*** not from the professor.

Disturbing class lectures will negatively impact the student's subjective evaluation. Talking during class, having a cell phone ring, etc... are disturbances that are unacceptable. These rules are designed to optimize the learning environment for all students.

Statement about Academic Integrity: This class will be conducted in full accordance with PKU's policies regarding academic integrity. Anyone caught cheating will be punished as severely as the school permits.

On group projects, each group is to work independently of other groups. Whereas it is OK for students between different groups to consult each other, each group's deliverable should be independently developed. Simply copying one group's project by another group will result in penalties for *both* groups. For the final (individual) exam, no consultation between students is allowed. The final (individual) exam is to be solely developed by each individual, with no assistance of any kind from any other person. Again, policies are designed with fairness in mind.

Educational Norms and Expectations: The student is responsible for material covered in any class. If a student misses a class, he/she should retrieve lecture notes from a classmate.

It is in the student's best interest to *read the relevant chapters in the book BEFORE the lecture*. That way, the student will find the lecture period to be much more productive.

Suggestions for improving the course: The professor is committed to making this course as good as possible. If the student has suggestions to improve the course, he/she should inform the professor, *IN PRIVATE*. (During a lecture is *not* the appropriate time for such feedback, as there is no time during the lecture for such discussions.)The course is obviously for the student's benefit, not the professor's. So any feedback is greatly appreciated and is seriously considered.

Add/Drop the Course: Per PHBS policy, the student is not allowed to add or drop this course after the first week.

Miscellaneous: Any issue not specifically addressed here will be handled at the discretion of the professor.

Course Schedule: Minor modifications to this schedule are possible, but this schedule is quite close to what we will actually cover. The professor will inform you if modifications are made.

Course Schedule:

Lecture	Dates	Primary Text Book Chapters (See next page for Ch. titles)	Projects
1	Friday, May 8, 2015	Introduction to Excel; Part 5 (Ch. 29, excluding VBA)	
2	Tuesday, May 12, 2015	Part 5 (Ch. 30, 31, 32, part of 33), Introduce Ch. 18 , and Ch. 1	
3	Friday, May 15, 2015	Part 5 (Continue Ch. 33)	
4	Tuesday, May 19, 2015	Part 5 (Ch. 34, 35)	
5	Friday, May 22, 2015	Part 1 (Ch. 1, 2?)	
6	Tuesday, May 26, 2015	Part 1 (Ch. 2 and Ch. 27)	#1, Due Thursday, May 28, 23:00
7	Friday, May 29, 2015	Part 1 (Ch. 3, 4)	
8	Tuesday, Jun 2, 2015	Part 1 (Ch. 4)	#2, Due Thursday, June 4, 23:00
9	Friday, Jun 5, 2015	Part 2 (Ch. 8, 9, 10)	
10	Tuesday, Jun 9, 2015	Part 2 (Ch. 12,15)	#3, Due Thursday, June 11, 23:00
11	Friday, Jun 12, 2015	Part 2 (Ch. 14)	
12	Tuesday, Jun 16, 2015	Ch. 16 self-study before class Part 3 (Ch. 17)	#4, Due Thursday, June 18, 23:00
13	Friday, Jun 19, 2015	Part 3 (Ch. 19)	
14	Tuesday, Jun 23, 2015	Part 3 (Ch. 20 and 21)	#5, Due Thursday, June 25, 23:00
15	Friday, Jun 26, 2015	Part 3 (Ch. 22 – 23)	
16	Tuesday, Jun 30, 2015	Part 3 (Ch. 24)	#6, Due Thursday, July 02, 23:00
17	Friday, July 3, 2015	Part 4 (Ch. 25, Start Ch. 26)	
18	Tuesday, July 7, 2015	Part 4 (Continue Ch. 26, Ch. 28)	
Final EXAM	<i>Wednesday, July 8, 2015</i>	2:00 – 5:00	Room 501?

Chapters in Simon Benninga, “*Financial Modeling*”, 3rd Ed., 2008, Massachusetts Institute of Technology, ISBN: 978-0-262-02628-4.

Part	Chapter	Title
Part 1		CORPORATE FINANCE MODELS
	1	Basic Financial Calculations
	2	Calculating the Cost of Capital
	3	Financial Statement Modeling
	4	Building a Financial Model: PPG Corporation
Part 2		PORTFOLIO MODELS
	8	Portfolio Models – Introduction
	9	Calculating Efficient Portfolios with No Short Sale Restrictions
	10	Calculating the Variance-Covariance Matrix
	12	Efficient Portfolios without Short Sales
	14	Event Studies
	15	Value at Risk
Part 3		OPTION-PRICING MODELS
	16	An Introduction to Options
	17	The Binomial Option-Pricing Model
	18	The Lognormal Distribution
	19	The Black-Scholes Model
	20	Option Greeks
	21	Portfolio Insurance
	22	An Introduction to Monte Carlo Methods
	23	Using Monte Carlo Methods for Option pricing
	24	Real Options
Part 4		BONDS
	25	Duration
	26	Immunization Strategies
	27	Modeling the Term Structure
	28	Calculating Default-Adjusted Expected Bond Returns
Part 5		TECHNICAL CONSIDERATIONS
	29	Generating Random Numbers
	30	Data Tables
	31	Matrices
	32	The Gauss-Seidel Method
	33	Excel Functions
	34	Using Array Functions and Formulas
	35	Some Excel Hints

FIRST DAY “HANDOUTS”, and Confirmation of Course Expectation

- (1) Ch. 11 (Brown Reilly) Growth Analysis.ppt; (2) Ch 1 Lecture Supplement.docx
 (3) FM Lecture 10 in class from Ch. 15 Supplement (VAR).pdf; (4) Regression Primer.docx
 (5) Regression Primer Supplement.pdf; (6) ROR Gross Returns Lognormal Risk Neutral Valuation, etc.docx
 (7) Financial Modeling Final Exam Guidelines.docx; (8);
 (9) FM Project Guidelines; (10) Chinese GaoKao incidents; (11) Peer Evaluation; (12) Group Selection;
 (13) Syllabus (including this sheet to be signed and returned at beginning of lecture #3).

PLUS: 28 Excel Files: Ch. 35, Lectures 1, 2, 3, 4, 5, 6, 7, 9, 9, 9, 10, 10, 11, 12, 12, 13, 14, 14, 15, 15, 16, 16, 17, 18, and 18. **PLUS:** Six (6) group project files.

This is the final page of the syllabus for Financial Modeling.

I received a copy of the **entire syllabus** (total number of pages is shown below).

I acknowledge receipt of all of the above **forty-seven (47) files**, some of which are **Excel files**, and some of which are **handouts**. I acknowledge that several **additional references** are listed in this syllabus, including **supplemental textbooks**.

I acknowledge that the first page of this syllabus contains a detailed **course description**. I understand that the course is **difficult**, and this description allows me to fully perform a **proper course assessment**, and accordingly, I choose to take this course as an elective.

Also on the first page, the professor's **office hours, office location, and email address** are clearly stated. This syllabus also contains a **detailed calendar of lectures, including content** (via Textbook chapter titles) for each lecture. Per the course description, this course examines a **wide range of knowledge**.

I have completed the **course pre-requisites**.

I understand that the final exam will be timed, in class, on Excel. (Thus, I realize that it is my responsibility to come with **adequate tools** to complete the task, i.e., a reliable computer capable of Excel and of saving my work onto a thumb drive.)

I understand that the professor will grade the solution to the final exam that I deliver to him via the **thumb drive** (Professor will **not** grade work located elsewhere, e.g., on a hard drive or an opened Excel file, etc...)

I understand that there are **6 projects** to be completed with my selected group members.

I understand that the course is **FAST-paced** and will require a lot of work.

I understand that I will be **treated fairly**, i.e., exactly the same as all other students per the guidelines described in this syllabus. I do not require special treatment, and **I will not request special treatment**, i.e., as part of selecting this elective course, I accept this syllabus' guidelines.

I understand exactly **how my course grade will be determined** per the guidelines in the syllabus.

I understand that **disturbing lectures** (e.g., talking) **negatively impacts** my subjective evaluation and may result in my **expulsion from lecture**. I understand that **arriving late** (and of course, **missing lectures**) (1) negatively impacts my course grade, and (2) is unacceptable, as professor **locks doors** when lecture begins.

I understand that if I miss a lecture, the **professor is not responsible for my securing information** covered during said lecture. (I will secure such information from a fellow student; not professor.)

I understand that **requesting professor to make any exceptions** in this syllabus is not only inherently **unfair** to all the rest of my classmates, but will **not be honored** and will send professor a negative signal, **negatively impacting my final score**.

I have read the syllabus **carefully**, and agree to abide by all guidelines.

Date, Student's Signature and Student ID Number: _____