FIN3716: Financial Modeling

Semester 1, 2025/2026

National University of Singapore — Department of Finance

Instructor: Assoc Prof LEE Hon Sing

- **Office:** MRB BIZ1 7-75
- **Telephone:** 6516-5665
- **Email:** honsing@nus.edu.sg
- **Consultation Hours:** By appointment via email

Course Overview

FIN3716: Financial Modeling aims to provide students with a strong foundation in the theories and methodologies of financial modeling, and to apply finance theories to solve practical problems in financial management, investments, portfolio management, and risk management. The course emphasizes the design and implementation of financial models using Microsoft Excel and VBA programming, covering key areas such as Corporate Finance models, Portfolio Models, Option-Pricing Models, and Bond Models, as well as simulation and selected numerical methods.

Course Objectives

- Develop a comprehensive understanding of the core theories and methodologies underlying financial modeling.
- Apply financial modeling techniques to practical problems in corporate finance, investment analysis, portfolio management, and risk management.
- Gain proficiency in using Microsoft Excel, including advanced tools and VBA programming, to build robust and efficient financial models.

Learning Outcomes

- Understand the four primary classes of financial models: Corporate Finance, Portfolio, Option-Pricing, and Bond Models.
- Design and implement financial models using Excel and VBA.
- Build a set of ready-to-use financial models applicable in professional or research settings.
- Critique and improve the efficiency and effectiveness of financial models.

Mode of Teaching

The course will be delivered as 13 three-hour seminars/workshops in a seminar room. Each session will be hands-on, requiring students to bring a laptop with:

- Microsoft Excel (latest version) with the Solver and VBA add-ons installed
- Internet access

Prerequisites

- ACC1701 Accounting for Decision-Makers
- FIN2704 Finance
- FIN3702 Investment Analysis and Portfolio Management

Reference Text

- **Financial Modeling** by Simon Benninga, MIT Press, 4th Edition, 2014.
  ISBN: 978-0262027281

Assessment Structure

Component	Weight (%)	Description
Mid-Term Quiz	30	2-hour open-book practical test (Examsoft), covering Lessons 1 to 6. Conducted in-class during Lesson 7.
Final Quiz	30	2-hour open-book practical test (Examsoft), covering Lessons 7 to 12. Conducted in-class during Lesson 13.
Group Project	30	Team-based project on company valuation using fundamental analysis, including model calibration, simulation, sensitivity analysis, and professional recommendations. Interim and final submissions required.
Class Participation	10	Active engagement and contributions in class discussions and activities.

Group Project Details

Students will form groups of five to value a listed company using fundamental analysis. The project involves five parts, including Pro Forma valuation, by-parts methodology, business driver analysis, risk simulations, and group reflection. Key deadlines: Parts 1 and 2 - Week 8, Friday 2359 hrs; Parts 3, 4, and 5 – Reading Week, Friday 2359 hrs.

Attendance and Participation Policy

- As this is a 100% continuous assessment course, missing more than two classes (excluding valid medical or compassionate reasons) may result in severe penalties or failure.
- Missing any assessment component without approved reasons will result in zero marks for that component. Substitute assessments may be provided for valid absences.
- Students are encouraged to provide feedback and suggestions to improve learning outcomes.
- Check Canvas frequently for announcements. Use the Canvas forum for discussion and NUS email for communication.

Academic Honesty & Plagiarism

Academic integrity and honesty are essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. **In case of any doubts, you should consult your instructor.**

Additional guidance is available at:
http://www.nus.edu.sg/registrar/adminpolicy/acceptance.html#NUSCodeofStudentConduct

Online Module on Plagiarism:
http://emodule.nus.edu.sg/ac/

Tentative Lesson Schedule

Week	Topic	Key Activities & Skills	Reference Chapters
1	Introduction to Excel & VBA	Excel functions, data tables, Excel hints, VBA basics (output to cells), first VBA program, exchange rate table, Solver, regression, using IF's, using OFFSET.	VBA notes, SB: Ch. 33, 30, 35
2	Personal & Corporate Finance Modeling	Time value of money, leasing analysis, cash flow projections, VBA For Next Loop, loan tables, balloon loans, retirement planning, CPF returns, leasing models, HDB rental returns.	SB: Ch. 1, 6, 7
3	Stock Valuation & Advanced VBA	Financial statement modeling, WACC estimation, stock valuation, VBA double For Next Loop, circular reference, cash as plug, debt as plug, constant debt ratio, operating leverage, geographical breakdown, discrete recapitalization, discrete fixed asset increment.	SB: Ch. 3
4	Portfolio Models & Matrix Computation	Matrices, Excel array functions, portfolio models introduction, VBA If Then Else, positive/negative beta, stock buy-sell strategy, matrix computations, portfolio return/variance, SIA & Sheng analysis.	SB: Ch. 2, 31, 34, 8

5	Efficient Frontier & Advanced Portfolio Techniques	GMVP via Solver, MVP with/without short sales, market portfolio computation, efficient frontier via formulas, alternative variance-covariance matrices, income tax modeling.	SB: Ch. 8, 9, 10
6	Black-Litterman Model & VaR	Useful VBA math functions, random walk, matching stock prices by date, Black-Litterman model, alternative Black-Litterman usage, VaR for STI.	SB: Ch. 12, 41
7	**Mid-Term Quiz (in-class)**	Practical test covering Lessons 1–6.	
8	Options & Structured Products 1	VBA Select-Case, VBA functions for transaction cost and stock price, Gordon Super Normal Growth Model, variable types, implied volatility, structured products: principal protection and participation in upside, up-up and away product.	SB: Ch. 36, 37, 13, 15
9	Options & Structured Products 2	VBA array basics, income tax computation with arrays, portfolio management with arrays, dice roll simulation, random number generation.	SB: Ch. 39, 16, 19
10	Option Pricing Simulations	VBA for call/put option valuation, stock price modeling with sub-periods, Asian call options, barrier options, basket options.	SB: Ch. 29, 18
11	Simulation & Binomial Models	VBA Forms, simulating investment returns, binomial option pricing (vanilla options and structured products), law of large numbers.	SB: Ch. 23, 22, 17
12	Bond Modeling & Yield Curve Analysis	Pricing a risky bond, modeling the yield curve, computing par yield, duration, and bond immunization.	SB: Ch. 25–28
13	**Final Quiz (in-class)**	Practical test covering Lessons 7–12.	

Take FIN3716 to boost your career prospects in the finance industry with hands-on modeling and practical skills sought after by top employers.