

Financial Modeling

APEC 4501

Spring 2009

Instructors:

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Office hours: to be announced

Class meeting times and location: M, W at 1:00 – 2:15 p.m. in 220 VoTech

Objective, Format and Expectations:

The objective of the course is to give students additional experience in designing and implementing solutions to financial management problems with the use of the Microsoft Excel® spreadsheet software. The course will emphasize the development of computer-based tools, rather than the use of existing tools or templates. In this way students will gain valuable practical experience in how to implement concepts and theories that are used in the fields of economics, finance, food and agricultural business management, and marketing.

The course will focus on developing spreadsheet applications that are conceptually sound and accurate, and also user-friendly enough that someone other than the developer would be able to perform useful work with them without extensive training.

This is a full-semester, 3-credit course that incorporates a combination of short introductory lectures, cases, and computer labs. The course will meet twice per week in the computer lab. On some topics there may be invited speakers to introduce or discuss an application with the class.

Since this course will cover topics that are new to many students and the introductions to the topics and problem sets will be kept purposely brief, it is expected that all students will read and familiarize themselves with the assigned material prior to attending the related class session.

Prerequisites:

This course is designed for juniors, seniors and other students who have taken adequate preparatory courses in applied economics, finance and accounting. The course requires students to have completed the first course in finance (APEC 3501 or FINA 3001) and the prerequisite in principles of accounting (ACCT 2050). Students should be familiar with, but need not be experts in the use of, Excel spreadsheets.

Texts, Instructional Materials and Website:

The class will be using various readings and course materials during the term. Some of these items will be posted on the class website and others will be made available in Magrath Library. Students are expected to stay current on these items.

- ❖ Benninga, Simon. *Financial Modeling*, Third Edition, MIT Press, 2008 (highly recommended). NOTE: This book will also be on reserve in Magrath Library.
- ❖ Instructor class notes that are handed out in class
- ❖ APEC 4501 class website URL: <http://www.apec.umn.edu/faculty/gpederso>
- ❖ Selected reserve readings will be placed in Magrath Library.
- ❖ Excel reference manuals and textbooks. A copy of each of these books will be on reserve in Magrath Library:
 - Sengupta, Chandan. *Financial Modeling: Using Excel and VBA*. Hoboken, New Jersey: Wiley, 2004. [NOTE: This book will be used as a supplement to Benninga. There will be several reading assignments in this book. Cost: \$55.]
 - Albright, S. Christian. *VBA for Modelers, Second Edition*. Belmont, California: Thomson, 2007 [NOTE: This book covers a number of VBA features and has example VBA code for a number of management applications that might provide ideas for term projects.]

There also are a number of other Excel reference manuals that can be accessed online through the University of Minnesota library website, <http://www.lib.umn.edu/>. Three that we have used are listed below. To access them, do a keyword search on “Excel” and the author last name:

- Walkenbach, John. *Excel 2007 Bible*
- Jacobson, Reed. *Microsoft Office Excel 2007 Visual Basic for Applications Step by Step*
- Walkenbach, John. *Excel 2007 Power Programming with VBA*

One way to bring up similar manuals by other authors is to use the browse box, select “LC Subject Heading begins...” and enter “Excel”. On the next screen, click on the link, [Microsoft Excel \(Computer file\) - \[LC Heading Information\]](#).

Access to the online manuals is limited to **ten users** at a time. If use is at the limit when you are trying to access one of these manuals, you will receive the message, “**please try again later.**”

Term Project:

In addition to the set of applications that are designed for weekly exercises, there will be a term project in which students will prepare a report that uses real world data and emphasizes some of the tools that are developed in the course. Students are encouraged to choose projects relating to a financial, management, or marketing problem in an industry of interest to them. A set of topics will be suggested as needed. Each student will present a term

project report to the class. When students submit term projects as a team, both members of the team will receive the same grade for the items that are jointly submitted.

Students will be expected to turn in a project report and an Excel spreadsheet. A good report has an introduction that clearly states the problem and the objective(s). It should have a section that carefully describes the relevant concepts, data sources, and how a user could use the spreadsheet to achieve the objectives. The report's analysis should be conceptually sound. The report should have a section that reports the results and a clearly stated set of conclusions. The last section is a list of references (if any). Adding a title page, etc. is a good idea. Spellcheck everything! Although there is no specific length requirement for the overall paper, the text portion of the paper should be not more than 10 pages of text (1.5-spaced in 12-point font). To that you can add any number of pages of exhibits (tables, charts, spreadsheets).

In the spreadsheet, give particular attention to accuracy in the calculations and formatting for clarity and readability. Use your judgment in selecting from Excel's features such as comments, data validation, macros, user-definable forms, and menus to make your spreadsheet as easy to use as possible.

Finally, on team projects we want to know who wrote what parts of the paper and spreadsheets.

Each student will also be assigned as a discussant for another student's term project report. The discussant's role will be to read the project report and review the Excel model in advance of the presentation, and to critically comment on the paper and the Excel application briefly (~5 minutes) following the presentation. The commentator should also ask questions for the paper presenters' responses. Each commentator must turn in his/her written comments and questions at the end of the session.

All students are expected to attend the student term project presentations. Attendance will be taken.

A sample of term project topics from recent years includes:

- Determine the intrinsic value of a company based on a discounted cash flow analysis with an Excel web query to download data and using macros to automate a sensitivity analysis
- Design a database and valuation decision tool for a commercial rental property
- Lease versus buy analysis (office equipment, construction equipment, etc.)
- Valuation of a restaurant
- Evaluating the efficiency frontier of a portfolio of mutual funds with automated downloading of fund financial information

- EVA analysis of a company
- Decision tool for selecting an employee benefit plan
- Designing a project cost (bid) estimator for a commercial millwork company using macros to automate the calculations
- Breakeven analysis of a retailing business
- Automated valuation model of recreational timberland using downloaded data and automating the regression analysis
- Capital budgeting analysis of a dairy farm expansion project
- Evaluating the economic feasibility of a small-scale, on-farm biodiesel processing investment

Grading:

Course grades will be given on a letter grade basis and will follow the University of Minnesota grading policy. Letter grades will be determined based on the quality of the graded items (homework problems, term project, and class participation).

There will be 8 graded homework problems. Two of these homework problems will be given numerical grades. The remaining 6 homework problems will collectively be assigned to a “contract grade” and each problem will be given a “pass/fail” score. If you receive a fail on a contract grade problem you must resubmit it until it is acceptable. You must submit all 8 of the homework problems to receive a grade for the course. Homework problems that are submitted late will be down graded by one-half letter grade for each class day they are late.

The term project will be graded as follows:

	<u>Maximum points</u>
<u>Written paper</u> (clarity of writing, why problem was chosen, decisions to be made, data sources documented, how to use the spreadsheet, results clearly interpreted)	40
<u>Excel model</u> (how well the model was structured, creativity, clarity/transparency, robustness, problem difficulty)	40
<u>Class Presentation</u> (verbal and PPT presentation and demonstration of the model)	<u>20</u>
Overall total points	100

The instructors will also grade each student on class participation. Participation will be determined from: class attendance, two short “Tips/Tools/Tricks” in-class presentations, verbal and written critique of another student’s term project. To receive credit, the “Tips/Tools/Tricks” presentation topics must be approved by the instructor in advance.

Grade reports may be given during the term to provide information to each student on his/her progress.

The final course grade will be determined based on the following weighting scheme:

Graded Item	Percentage weight
Homework problems (2) - - numerical grade	24%
Homework problems (6) - - contract (pass/fail) grade	36%
Term project report	30%
Quizzes (2)	5%
Participation (2 short presentations, term project critique, and attendance.)	5%

The final course grade distribution will be based approximately on: 90-100% = A; 80-90% = B; 70-80% = C; 60-70% = D. Partial (+/-) grades (e.g., A-, B+, etc.) will also be assigned in accordance with these general guidelines.

A NOTE ON SUBMITTING HOMEWORK ASSIGNMENTS BY E-MAIL:

Submit your Excel worksheet with a name that includes your last name, first initial, and lab/assignment number (e.g., SmithK_Lab#1.xls. E-mail the file to the instructor (see email addresses above). E-mail messages that contain attached files with assignments must include APEC4501 in the message subject line to be counted.

Class Schedule:

Week/Days/Instructor	Topic	Homework Problems
Jan 21 Bill Lazarus & Glenn Pederson	Course introduction and overview	
Jan 26 Glenn Pederson	Financial statements	Assign Hwk Problem #1 (pass/fail)
Jan 28		Hwk #1 Due
Feb 2 Glenn Pederson	Credit scoring	Assign Hwk Problem #2 (pass/fail)
Feb 4		
Feb 9		Hwk #2 Due
Feb 11 Glenn Pederson	Portfolio analysis and Value at Risk	Assign Hwk Problem #3 (graded)
Feb 16		
Feb 18		Hwk #3 Due
Feb 23 Glenn Pederson	Option pricing	Assign Hwk Problem #4 (pass/fail)
Feb 25		
Mar 2		Hwk #4 Due; First report on term project topic
Mar 4 Bill Lazarus	Capital budgeting methods	Assign Hwk Problem #5 (pass/fail)
Mar 9	Purchase/lease	
Mar 11		Hwk #5 Due
** SPRING BREAK ** (Mar 16 –18)	NO CLASS	
Mar 23 Bill Lazarus	Modeling management flexibility as a real option	Assign Hwk Problem #6 (graded)
Mar 25 Bill Lazarus		Second (update) report on term project topic
Mar 30		Hwk #6 Due
Apr 1 Bill Lazarus	VBA introduction and functions	Assign Hwk Problem #7 (pass/fail)
Apr 6		
Apr 8		Hwk #7 Due
Apr 13 Bill Lazarus	VBA macros	Assign Hwk Problem #8 (pass/fail)
Apr 15		
Apr 20		Hwk #8 Due
Apr 22	Term Project presentations	
Apr 27	Term Project presentations	
Apr 29	Term Project presentations	
May 4	Term Project presentations	

May 6	Term Project presentations	
Finals Week (May 11 and 13)	Term Project presentations	

Readings and Resources:

<u>Week</u>	<u>Reading</u>	<u>Availability</u>
Jan 26	Benninga, Ch. 3 and Ch. 30	Reserve
Feb 2	Benninga, Ch. 33 (811-816)	Reserve
	Sengupta, Ch. 4 (101-106)	Reserve
	Farm finance scorecard; risk model examples	Web site
Feb 11	Benninga, Ch. 8 and Ch. 15	Reserve
	Palisade @Risk Manual, Chs. 2 and 3 (skim), Ch. 4 (59-90), Ch. 5 (119-122)	Web site
Feb 23	Benninga, Ch. 16 (skim); Ch. 17 (443-458); Ch. 19 (509-524)	Reserve
	Sengupta, Chs. 12 and 13	Reserve
Mar 4	Benninga, Ch. 1	Reserve
	Excel Help material on the financial functions NPV, IRR, PMT, VDB, PPMT and IPMT, along with Data Tables, Goal Seek, and ISERR	Excel
	IRS Publication 946, "How to Depreciate Property", pp. 30-45 and Appendices A and B	Web site
Mar 9	Benninga, Ch. 6	Reserve
Mar 23	Benninga, Chs. 18 and 24	Reserve
	Meyers, "Finance Theory and Financial Strategy," chapter from Schwartz and Trigeorgis, ed., <u>Real Options and Investment under Uncertainty</u> , 2001, pp. 19-32.	Reserve
	Dixit and Pindyck, "The Options Approach to Capital Investment," <u>Harvard Business Review</u> , May-June 1995, pp. 105-115	Library E- Journals
Apr 1	Read either Sengupta, Ch. 14 – 17, or	Reserve
	Walkenbach, <u>Excel 2007 Power Programming with VBA</u> , Ch. 7-10	Library online resource