Course Design Document

IS102 Computer as an Analysis Tool

Version 2.6

14 June 2011

Table of Content

23.0 Versions History

Version	Description of Changes	Author	Date
1.0	• Reviewed 27 Nov 2003 by Prof Miller, Dean SIS • Initial release for use in 2003 Term 2	Leong Thin Yin	1 Dec 2003
1.1	• Removed all ExtendLT material • Re-paced to better accommodate student learning • Moved course admin notes to a separate document • Added Table of Contents • Presented on 6 Feb 2004 to Profs Bill Massey, Mark Wessel (Dean, Heinz School CMU) & SMU SIS faculty for review	Leong Thin Yin	29 Apr 2004
1.2	• Added GoldenCrossClinic.xls, Prisoners.xls • Added more tools (weekplanner, survey, stockportfolio) • Add Powell & Baker as reference text • Re-designated OPIM102 (from OPIM201) • Updated for use in 2004 Term 1	Leong Thin Yin	14 Jul 2004
1.3	• Move wk 11 to wk 1, slide others down • Updated for 2004 Term 2	Leong Thin Yin	3 Dec 2004
1.4	• Added new exercises • Updated for 2005 Term 1	Leong Thin Yin	22 July 2005
1.5	• Minor updating for 2005 Term 2	Leong Thin Yin	30 Nov 2005
1.6	• Moved Data analysis from wk 5 to wk 10 • Minor updating for 2006 Term 1	Leong Thin Yin	23 Jun 2006
1.7	• Minor updating for 2006 Term 2	Leong Thin Yin	4 Dec 2006
1.8	• Revised course code to IS102 • Minor updating for 2007 Term 1	Leong Thin Yin	11 Jul 2007
1.9	• Minor updating for 2007 Term 2	Leong Thin Yin	21 Nov 2007
2.0	• Revised to conform to SIS standard format • Updated for 2008 Term 1	Leong Thin Yin	1 Jul 2008
2.1	• Change CAT coordinator to Lee Wee Leong	Lee Wee Leong	29 Dec 2008
2.2	• Minor updating	Leong Thin Yin	16 Mar 2009
2.3	• Remove Assignment 4	Lee Wee Leong	4 July 2009
2.4	• Update latest LOMS template	Lee Wee Leong	1 Aug 2009
2.5	• New document structure	Lee Wee Leong	12 June 2010
2.6	• Update textbook edition & weekly plan reference	Lee Wee Leong	23 July 2010
2.7	• Update LOMS	Lee Wee Leong	4 Dec 2010

2.0 Overview of the Computer as an Analysis Tool Course

2.1 Synopsis

In this course, students acquire practical skills (bridging technology and real-world situations) in modeling and resolving business problems using personal computers. With computers becoming essential tools for executives in most organizations, knowing how to effectively use them to solve problems will be very helpful in other business courses and students' future professional career.

2.2 Prerequisites

None

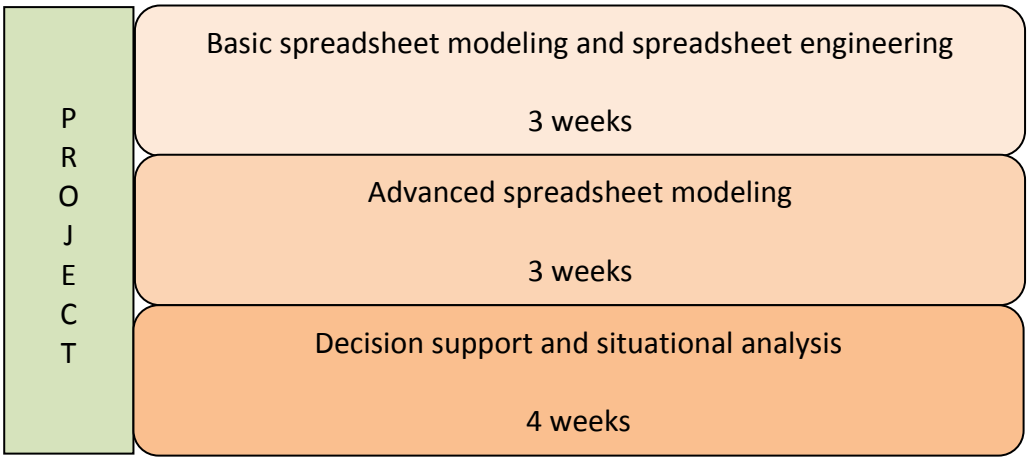
2.3 Objectives

Upon completing the course, students will

- Know how to frame problems, and integrate various analytical skills (e.g. statistics and mathematics) to model and address management concerns.

- Be comfortable with the personal computer, motivated to self-learn problem analysis computer tools and know where to get relevant information and system resources.
- Be familiar with a variety of software solutions (e.g. add-ins) and gain competency in using a spreadsheet application as an analysis, model verification, simulation and management reporting tool.

2.4 Structure of the course



2.5 Teaching staff

Practice Assist. Prof. Lee Wee Leong (course coordinator)

3.0 Output and Assessment Summary

3.1 Individual Assignment (30%)

- Assignment 1 (10%): Spreadsheet modeling with basic features.
- Assignment 2 (10%): Spreadsheet modeling with advanced features.
- Assignment 3 (10%): Spreadsheet modeling for data analysis and decision support.

Note: Marking scheme for assignments

- 60% Correctness
- 20% Documentation
- 10% Formatting
- 10% Bonus (advanced features/formulation elegance)

Assignments are to be submitted in softcopy

3.2. Group Project (30%)

- Students to form consulting teams of up to 5 members to devise and construct for a real client an original problem model.
- Problem must be of sufficient depth with a structure that permits a suitable model to be built and whose solution requires analysis.
- Modeling and analysis must appropriately use spreadsheet techniques covered in the course and, where necessary, other tools and add-ins.
- More details will be released in first few classes.

3.3. Final Exam (0%)

- None

3.4. Class Participation (15%)

- Details will be announced in the first class.

3.5. Mid Term Quiz (25%)

- Open-book (1.5 hours, 3 questions) test covers a reasonably wide range of spreadsheet modeling skills.
- Questions would be posed as business problems and students are to return numerical values or spreadsheet formulas in spaces provided in the test (hardcopy) workbook.

3.6. Lab Exercises (0%)

- None

3.7. Grades release schedule

Labs	NA
Mid Term Quiz	one week after quiz
Participation	at the end of term
Final exam	NA
Group project	at the end of term
Individual Assignment	one week after submission

4.0 Group Allocation for Assignments

Assignment No	How groups are formed?	Max size of the team
Team Project	Students form the group	5

5.0 Classroom Planning

There is one 3-hour classroom session per week, divided into two sessions with a 15 minutes break in between.

5.1 Course Schedule Summary

Wk	Topic	Events
1	Basic Modeling in Excel	
2	Spreadsheet Engineering	Try: Assignment 0
3	Functional Relationship	Due: Assignment 1
4	Data Lookup and Linkup	
5	Monte-Carlo Simulation	Due: Assignment 2
6	It's about Time	
7	Mid-Term Test / Decision Support	Due: Assignment 3
8	Recess Break	
9	Project Proposal	Due: Proposal Report
10	Data Analysis	
11	Decision-making	
12	Project Presentation	Due: Project Presentation
13	Project Presentation	Due: Final Report
14	Study Week	No Finals!

5.2 Lab Exercises

None

5.3 Weekly plan

Week	Objective	Outline	Reference	Reminders
1	• Know course scope, schedule, assessment and assignments • Be motivated by the purpose and potential value of the course • Can construct simple spreadsheet models	• Financial Statement, or equivalent • Alex Processing, or equivalent • Achilles and the Tortoise, or equivalent	• Leong and Cheong chapter 1 & appendix A (notes 1-3)	• Students must bring their notebook computers to class every week • Try out assignment 0 at home and compare against solution • At least 6 hours per week of out of class preparations
2	• Understand how modeling is an effective tool in solving problems • Know how to check correctness and ask analyzing questions • Know how to construct a pleasing chart to present a problem situation	• Multiplication Table, or equivalent • Financial Projection, or equivalent • F1 Night City Race, or equivalent • Village Coffee, or equivalent	• Leong and Cheong chapter 2 & appendix A (note 4)	• Assignment due next week
3	• Able to build models with different functions and variable types • Know how to generate tables of information from formulas • Know how to add fool-proofing and user-friendly features • Able to do iterative recursive computations	• Time Value or Flexible Loan, or equivalent • Black-Scholes , or equivalent • Charity Donation, or equivalent	• Leong and Cheong chapter 4 & appendix A (note 10)	• Collect assignment 1 • Students to form project teams by next week latest
4	• Able to automate lookup of information from a data list • Able to record, minor edit and run macros	• Data Import, or equivalent • Echo Office Supplies, or equivalent • CCH Kindergarten, or equivalent	• Leong and Cheong chapter 3 & appendix A (notes 5 & 12)	• Assignment 2 due next week • Project teams to start thinking about topic and work on proposal
5	• Understand the importance of simulation to verify analytical results • Able to setup simulation models and test decision choices under uncertainty	• Monte Hall or John Lim's Retirement, or equivalent • Data Simulation, Portfolio Simulation or Resampling, or equivalent • Statistics Review, Probability Functions and Frequency Distribution, or equivalent	• Leong and Cheong chapter 6 & appendix (notes 6 & 7)	• Collect assignment 2 • Project teams to arrange to meet instructor to get in-principle approval for their project before end of week 6

6	• Able to do computations with time and date variables • Understand how to build a spreadsheet decision-support system • Able to read, edit and write simple macros / VBA codes	• Timer Clicker, or equivalent • XDB Bank, or equivalent • Useful VBA and Count Down, or equivalent	• Leong and Cheong chapter 7, appendix A (notes 8 & 9) & appendix B (notes 16 & 17)	• Assignment 3 due next week • Mid-term test next week in class. Seating will be randomized.
7	• Test students' ability to grasp key modeling skills • Know how to interactively extract information from a data list	• Mid-term test • ABC Services, or equivalent • Best Tankee, or equivalent	• Leong and Cheong chapter 9	• Collect assignment 3 • Work out proposal (and final) presentation order • Project proposal due in week 9 (after week 8 recess break)
8	Recess			
9	• Able to present a clear and concise project proposal • Able to discern the trivial from the important • Confident in completing their team's project by the deadline	• Make presentation and respond to questions • Evaluate and comment on other projects	• Leong and Cheong appendix A (notes 14 & 15) & appendix B (notes 20, 21 & 22)	• None
10	• Able to compute basic statistics of data sets • Able to fit data to statistical distributions • Able to assess risks of decision choices • Able to compile multi-attribute data statistics	• Statistical Lies, or equivalent • Hotel Apex or Data Fit, or equivalent • Grand Grocery, or equivalent • Wonder Cookies or Yankee Fruits, or equivalent	• Leong and Cheong chapter 8 appendix A (notes 11 & 13)	• Student to volunteer to do the modeling in front of class in next week.
11	• Understand the complexity of decision-making • Appreciate practical aspects of basic decision-making • Understand the relevance of using the right frames of reference and tools	• Buy, Share and Rent, or equivalent • WXYZ Construction, or equivalent • Tree-Plan add-in • Crazy Auction or Google Adwords, or equivalent	• Leong and Cheong chapter 5 appendix B (notes 18 & 19)	• None
12	• Able to comment on other projects • Able to present own project and show teamwork	• Project presentation	• None	• Project report, powerpoint and workbooks due next week

13	• Able to comment on other projects • Able to present own project and show teamwork	• Project presentation • Course roundup • Project showcase	• None	• Collect project reports

6.0 List of Information resources and references

6.1 Course Textbook

- Leong and Cheong 2011. *Business Modeling with Spreadsheets: Problems, Principles,and Practice*, 2nd edition, McGraw-Hill.

6.2 Reference Books

- Walkenbach and Banfield 2007. *Excel2007 for Dummies*, Wiley.
- Winston 2007. *Microsoft Excel 2007: Data Analysis and Business Modeling*, Microsoft Press.
- Powell and Baker 2007. *The Art of Modeling with Spreadsheets*, 2nd edition, Wiley.
- Walkenbach 2004. *Excel VBA Programming for Dummies*, Wiley.

7.0 Tooling

- The course uses Microsoft Excel 2007 extensively for class exercises and games.
- The Excel exercises are taken out of Leong and Michelle 2009.
- Equivalent exercises may be devised by individual instructors in place of them.

8.0 Learning outcomes, achievement methods and assessment

	IS102 – CAT		Course-specific core competencies which address the Outcomes	Faculty Methods to Assess Outcomes
1	**Integration of business & technology in a sector context**			
	1.1 Business IT value linkage skills			
	1.2 Cost and benefits analysis skills	YY	• Identify the decision variables, parameters, performance measures and consequence variables of a business problem • Perform data analysis, compute simple statistics and assess risks of decision choices	• Grade and give feedback on assignments 1, 2, 3 • Grade and give feedback on documentation and presentation of the team project
	1.3 Business software solution impact analysis skills	YY	• Design a spreadsheet model as a decision support tool and understand its use by end-users • Use spreadsheet model to obtain understanding and derive alternative solutions to business problems • Create an influence diagram of a business problem • Create a black-box view of a business problem • Identify key drivers and establish backward relationships between variables when devising solution to a business problem • Identify the key benefits of simulation to verify analytical results	• Grade and give feedback on assignments 1, 2, 3 • Grade and give feedback on midterm quiz • Grade and give feedback on documentation and presentation of the team project
2	**IT architecture, design and development skills**			
	2.1 System requirements specification skills			
	2.2 Software and IT architecture analysis and design skills	YY	• Use spreadsheet as an object oriented environment with dynamic data exchange • Frame real-life problem and integrate other business analysis skills to model and address broad business problem • Identify the data requirement for modeling	• Grade and give feedback on assignments 1, 2, 3 • Grade and give feedback on documentation and presentation of the team project

	2.3 Implementation skills	YY	• Construct and validate simple spreadsheet model of real world business problem • Use spreadsheet as a small scale data repository and its management • Effectively use the intermediate and advanced functions in Excel • Create Monte-Carlo simulation using spreadsheet • Create and run macros to perform repetitive tasks • Create modeling situations in real time via Time-based & Process-based simulations	• Grade and give feedback on assignments 1, 2, 3 • Grade and give feedback on mid-term quiz
	2.4 Technology application skills	YY	• Increase competence with PC, problem analysis and applications for decision support tools • Use Excel Solver to perform basic optimization by maximizing/minimizing an objective function and defining system constraints • Use spreadsheet add-on tools to perform basic decision-making	• Grade and give feedback on assignments 1, 2, 3 • Grade and give feedback on documentation and presentation of the team project
3	**Project management skills**			
	3.1 Scope management skills	Y	• Manage the scope of the project under resource and schedule constraints	• Grade and give feedback on team project proposal
	3.2 Risks management skills	Y	• Manage the uncertainties throughout the project.such as scope creep and other project risks.	• Grade and give feedback on documentation of the team project
	3.3 Project integration and time management skills	Y	• Manage a project with a real client in the community and complete it to their expectation	• Grade and give feedback on documentation and presentation of the team project
	3.4 Configuration management skills			
	3.5 Quality management skills			
4	**Learning to learn skills**			
	4.1 Search skills			
	4.2 Skills for developing a methodology for learning			
5	**Collaboration (or team) skills:**			
	5.1 Skills to improve the effectiveness of group processes and work products			

6	**Change management skills for enterprise systems**			
	6.1 Skills to diagnose business changes	YY	• Perform what-ifs analysis using spreadsheet functions • Perform trade-off analysis to reflect how much of one performance measure must be sacrificed to achieve a given improvement in another performance measure • Perform sensitivity analysis to examines the effect of small changes in a given input variable on a performance measure • Perform iterative computation using DataTable function in Excel • Evaluate and test possible decision choices under uncertainty and incomplete information	• Grade and give feedback on assignments 1, 2, 3 • Grade and give feedback on mid-term quiz • Grade and give feedback on documentation and presentation of the team project
	6.2 Skills to implement and sustain business changes			
7	**Skills for working across countries, cultures and borders**			
	7.1 Cross-national awareness skills	Y	• Effectively communicate and resolve conflicts while working in a team with peers of various abilities, nationalities and backgrounds	• Grade and give feedback on documentation of the team project
	7.2 Business across countries facilitation skills			
8	**Communication skills**			
	8.1 Presentation skills	YY	• Prepare and efficiently deliver a presentation to convince the stakeholders of the value of the proposed solution to the business problem	• Grade and give feedback on presentation of the team project
	8.2 Writing skills	Y	• Prepare assignments as professional consultancy reports • Write a report to convince the stakeholder the value of the proposed solution to a business problem	• Grade and give feedback on documentation of the team project

YY This sub-skill is a main focus for this course.
Y This sub-skill is covered partially by the course.