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MFIN 707 Financial Modeling Using Excel & VBA Winter 2019 Course Outline

Finance and Business Economics Area DeGroote School of Business McMaster University

COURSE OBJECTIVE

This course is designed to cover the intricacies of financial modelling in a spreadsheet setting. Students will gain thorough exposure to how to build a detailed financial model, determine key input variables, integrate different models, document and test the modelling process, and enhance a model with programming languages, such as Visual Basic for Applications and Python. A real-life financial modelling project will cap the work completed during the term.

INSTRUCTOR AND CONTACT INFORMATION

Class Timing: **Fridays at 11.30 AM or 2.30 PM** All times referenced in this document are Eastern.

Adeel Mahmood

Instructor Tel: 905-525-9140 Ext (TBA) Office Hours: After class or by appointment

COURSE ELEMENTS

Credit Value:	3	Leadership:	Yes	IT skills:	Yes	Global view:	Yes
A2L:	Yes	Ethics:	No	Numeracy:	Yes	Written skills:	Yes
Participation:	Yes	Innovation:	Yes	Group work:	Yes	Oral skills:	Yes
Evidence-based:	Yes	Experiential:	No	Final Exam:	No	Guest speaker(s):	No





COURSE DESCRIPTION

Financial modeling involves the creation of tools that someone, other than the writer, can use to answer "what if" questions in finance. The course will examine the tools built into Excel and VBA and their use in financial modeling, with an emphasis on documentation and industry-best practices. The models used for this purpose include those covering financial statement forecasts, asset pricing, portfolio management, risk management, and other finance problems.

A working knowledge of Excel is assumed although no prior experience with VBA is required.

LEARNING OUTCOMES

Upon completion of this course, students will be able to complete the following key tasks:

- Identify the key finance and accounting terms and concepts used in financial models.
- > Apply best practices and efficiency tools for general-purpose spreadsheet modeling.
- Determine the key input variables to a range of financial models.
- Integrate and link key financial statements and ratios into a financial model.
- Perform key sensitivity and scenario analyses to determine how robust the model is under a range of assumptions.
- Learn to document and test a financial model.
- > Learn to work with and use a range of external data with a spreadsheet model.
- > Learn to program a financial model using Visual Basic for Applications (VBA).
- > Obtain an introduction to another programming language, such as Python, for financial modeling.

COURSE MATERIALS AND READINGS

Required:

Course content and class communication available on Avenue:

<u>http://avenue.mcmaster.ca</u>

Optional:

Benninga; <u>Financial Modeling</u>; *Fourth (4th) Edition*; The MIT Press, 2014:

- ISBN: 978-0262027281
- Comprehensive finance-focused text, also useful in other finance courses





Walkenbach; Excel 2016 Bible; First (1st) Edition; Wiley, 2015:

- ISBN: 978-1119067511
- Traditional-style manual for Excel, without any particular finance focus
- Helpful in gaining understanding of broader Excel usage

McKinney; Python for Data Analysis, First Edition; O'Reilly Media, 2012:

• ISBN: 978-1449319793

EVALUATION

Individual learning in this course results from in-class discussions, problem solving, and lab work. The balance of the individual learning results from lectures on specific topics, student research, and industry speakers. Team learning focus of this course is on an applied group project centred on a financial model.

The final grade will be calculated as follows:

Components and Weights

Class Participation	In-class contribution (individual)	10%
Term Tests	Written in the 6^{th} and 12^{th} classes (individual)	2 x 25%
Spreadsheet Assignment	Due after the 9 th class (group)	10%
Group Project	Due at the end of the term (group)	30%
Total		100%

Class Participation

Name cards are used to help give credit for class participation and contribution to in-class problemsolving. Students must have name cards with their full first and last names clearly written and displayed in front of them for every class. It is imperative that students prepare for every class. **Class participation marks are primarily based on the quality of contribution.** No class attendance results in <u>zero</u> mark.



Although class participation in this course will primarily be a function of solving the assigned problems and questions in class, participation in

discussions and other class aspects will also be considered. The determination of a student's level of participation in a class will be in the Instructor's sole discretion. The students are, however, provided the guidelines below.

The grading for participation in each class generally follows a scheme on a scale of 0 to 3:

Grade	Student Contribution		
0	Does not attend class		
1	Attends class but makes no contribution during that class		
2	Attends class and makes one average contribution during that class		
3	 Attends class and makes a significant contribution to the class by making important points with elements of originality or mastery of relevant issues or concepts – as demonstrated, during that class, by: Making one or more excellent contributions; Making two or more average contributions; Solving one or more problems for the class in class; or Providing other satisfactory evidence of significant contribution. 		

Note that there is no partial (non-integer) participation grade awarded for a class.

Students may be asked to share their analysis with, or otherwise present their arguments to, the class in order for their contribution to be qualified as significant.

A student **missing a class** during the term, excluding a class where a test or an exam is held, is required to contact the MFIN Program Office and obtain an official approval of relief if he or she wishes to avoid getting a zero (0) participation grade for that class.

If the MFIN Program Office adjudicates that relief be provided, the student's participation grade for the classes with relief requests will be re-assigned to the graded classes. See the section *Missed Academic Work* below for more details.

Notwithstanding the above, of the eight classes graded for participation, **students' participation will be based on the best six out of eight classes**. That is, each student will be assigned a total participation grade using the six highest (out of eight total) individual class participation scores. Note that these participation marks are normally reserved for class participation during the section of the class <u>without</u> any tests, quizzes, or presentations.





Term Tests

Two term tests – **open-book**, **open-notes** tests – will be written in the <u>6th</u> and <u>12th weeks</u> of the term. More details of the format, structure, and content coverage will be provided during the course of the term.

A student *missing a Term Test* is required to contact the MFIN Program Office and obtain an official approval of relief if he or she wishes to avoid getting a zero (0) grade for the test. If the office adjudicates that relief be provided, the student's grade for the test will be calculated based on the scheme outlined in the *Missed Tests* document available online.

Spreadsheet Assignment

Students will form groups for this component. In the *Spreadsheet Assignment*, each group will complete a spreadsheet assignment focused on financial modelling and using the concepts introduced in the course. More details of the format, structure, and content coverage will be provided during the course of the term.

Each student group will also complete the **Group Project** as described elsewhere in this document. The group members will be assigned individual grades relative to the group grade based on the peer assessments completed towards the end of the course.

Group Project

Each student group will also complete the *Spreadsheet Assignment* as described elsewhere in this document. *The group members will be assigned individual grades relative to the group grade based on the peer assessments completed towards the end of the course*.

The *Group Project* is due at the end of the term. The project will entail building and documenting a real-life financial model using the concepts covered in the course.

More details of the format, structure, and length of the project will be provided during the course of the term.





Conversion

At the end of the course your overall percentage grade will be converted to your letter grade in accordance with the following conversion scheme.

LETTER GRADE	Percent	
A+		90 - 100
А		85 - 89
A-		80 - 84
B+		75 - 79
В		70 - 74
B-		60 - 69
F		00 - 59

Communication and Feedback

Students who wish to correspond with instructors or TAs directly via email must send messages that originate from their official McMaster University email account. This protects the confidentiality and sensitivity of information as well as confirms the identity of the student. Emails regarding course issues should NOT be sent to the Area Administrative Assistants. Instructors are required to provide evaluation feedback for at least 10% of the final grade to students prior to Week #9 in the term. Instructors may solicit feedback via an informal course review with students by Week #4 to allow time for modifications in curriculum delivery.

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at: www.mcmaster.ca/academicintegrity

The following illustrates only three forms of academic dishonesty:





- 1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- 2. Improper collaboration in group work.
- 3. Copying or using unauthorized aids in tests and examinations

AUTHENTICITY/PLAGIARISM DETECTION

In this course we will be using a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. Students will be expected to submit their work electronically either directly to Turnitin.com or via Avenue to Learn (A2L) plagiarism detection (a service supported by Turnitin.com) so can be checked for academic dishonesty. Students who do not wish to submit their work through A2L and/or Turnitin.com must still submit an electronic and/or hardcopy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com or A2L. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). To see the Turnitin.com Policy, please go to; www.mcmaster.ca/academicintegrity.

REQUESTING RELIEF FOR MISSED ACADEMIC WORK

Students may request relief from a regularly scheduled midterm, test, assignment or other course components. Please refer to the policy and procedure on the DeGroote website at the link below; <u>https://mfin.degroote.mcmaster.ca/current-students/missed-term-work/</u>

STUDENT ACCESSIBILITY SERVICES

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail <u>sas@mcmaster.ca</u>.

For further information, consult McMaster University's Policy for Academic Accommodation of Students with Disabilities:

http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf





ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (**RISO**)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation should submit their request, including the dates/times needing to be accommodated and the courses which will be impacted, to their Faculty Office normally within 10 days of the beginning of term or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

POTENTIAL MODIFICATION TO THE COURSE

The instructor reserves the right to modify elements of the course during the term. There may be changes to the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

Research Using Human Subjects

All researchers conducting research that involves human participants, their records or their biological material are required to receive approval from one of McMaster's Research Ethics Boards before (a) they can recruit participants and (b) collect or access their data. Failure to comply with relevant policies is a research misconduct matter. Contact these boards for further information about your requirements and the application process.

McMaster Research Ethics Board (General board): <u>https://reo.mcmaster.ca/</u> Hamilton Integrated Research Ethics Board (Medical board): <u>http://www.hireb.ca/</u>





ACKNOWLEDGEMENT OF COURSE POLICIES

Your enrolment in this course will be considered to be an implicit acknowledgement of the course policies outlined above, or of any other that may be announced during lecture and/or on A2L. It is your responsibility to read this course outline, to familiarize yourself with the course policies and to act accordingly.

Lack of awareness of the course policies **cannot be invoked** at any point during this course for failure to meet them. It is your responsibility to ask for clarification on any policies that you do not understand

CL.	DATE	FINANCE CONTENT	EXCEL TOPIC		
1	Fri. Jan 11	Introduction Intro to Financial Modelling	_		
2	Fri. Jan 18	Financial Statement Modelling I Forecasting financial statements using spreadsheets	• Various Excel functions / tools		
3	Fri. Jan 25	Financial Statement Modelling II Integrating financial statement worksheets, completing valuations	• Various Excel functions / tools		
4	Fri. Feb 1	Portfolio Modelling Investment portfolios, betas, variances, performance measurement	 Datatables, arrays, pivot tables Matrix operations 		
5	Fri. Feb 8	Forecasting and Optimization Macro forecasting, optimization techniques, predictive analytics	 Solver, Analysis Toolkit, Regression, Scenario analysis 		

COURSE SCHEDULE





CL.	DATE	FINANCE CONTENT	Excel Topic		
6	Mon. Feb 11	Term Test 1 – To Be Written on Campus			
-	Fri. Feb 22	Midterm Recess (No Class)			
7	Fri. Mar 1	VBA / Programming I Intro to VBA / programming	• VBA, macros		
8	Fri. Mar 8	VBA / Programming II Working with custom functions	• VBA, custom functions		
9	Fri. Mar 15	Financial Software Integration Use with Bloomberg and third-party software Spreadsheet Assignment due online by 11.00 AM on the following Monday	• (To Be Announced)		
10	Fri. Mar 22	Introduction to Python Fundamentals, key libraries	 Numpy, Pandas, Matplot 		
11	Fri. Mar 29	Introduction to Data Science w/ Python Applications to data analytics Project Proposal due online by 11.59 PM	• Scikit Learn, others		
12	Fri. Apr 5	Term Test 2 – To Be Written on Campus			
13	Fri. Apr 12	Course Wrap-up Course Review, Final Modelling Tips, Project Progress Check	-		
-	Mon. Apr 15	Group Project – Due by 11.00 AM			