FINANCE 707
Financial Modeling Using Excel & VBA
Winter 2020 Course Outline

Finance and Business Economics Area
DeGroote School of Business
McMaster University

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. The tools employed will also include use of an introductory programming language.

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

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:	No
Avenue:	Yes	Ethics:	No	Numeracy:	Yes	Written skills:	Yes
Participation:	Yes	Innovation:	Yes	Group Work:	Yes	Oral skills:	Yes

COURSE PREREQUISITES AND COMPLEMENTS

Students should have the academic credit of Finance 601 or equivalent prior to the start of this course.

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.

REQUIRED COURSE MATERIALS AND READINGS

Course content and class communication available on Avenue:
- http://avenue.mcmaster.ca

OPTIONAL COURSE MATERIALS AND READINGS

Benninga; Financial Modeling; *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 6th and 12th classes (individual)	2 x 25%
Spreadsheet Assignment	Due after the 10th 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 problem-solving. 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 **6<u>th</u>** and **12<u>th</u> classes** 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 Tern Test*** is required to contact the academic 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

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.

Students will form groups for this component. 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

Students will form groups for this component. 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.

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.

ACADEMIC DISHONESTY

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

MISSED ACADEMIC WORK

Missed Mid-Term Examinations / Tests / Class Participation

Where students miss a regularly scheduled mid-term or class participation for legitimate reasons as determined by the MFIN Program Office, the weight for that test/participation will be distributed across other evaluative components of the course at the discretion of the instructor.

Documentation explaining such an absence must be provided to the MFIN Program Office within five (5) working days upon returning to school.

To document absences for health-related reasons, please provide the Petition for Relief for MFIN Missed Term Work and the McMaster University Student Health Certificate which can be found on the DeGroote website at https://mfin.degroote.mcmaster.ca/current-students/forms/.

Please do not use the online McMaster Student Absence Form as this is for Undergraduate students only.

University policy states that a student may submit a maximum of three (3) Medical certificates per year after which the student must meet with the Program Director.

To document absences for reasons other than health related, please provide the Petition for Relief for MFIN Missed Term Work which can be found on the DeGroote website at https://mfin.degroote.mcmaster.ca/current-students/forms/ and documentation supporting the reason for the absence.

Students unable to write a mid-term at the posted exam time due to the following reasons: religious; representing university at an academic event; conflicts between two overlapping scheduled mid-term exams; or other extenuating circumstances have the option of applying for special exam arrangements. Such requests must be made to the MFIN Program Office at least ten (10) working days before the scheduled exam along with acceptable documentation. Instructors cannot themselves allow students to unofficially write make-up exams/tests.

Adjudication of the request must be handled by the MFIN Program Office.

If a mid-term exam is missed without a valid reason, students will receive a grade of zero (0) for that component.

Missed Final Examinations

A student who misses a final examination without good reason will receive a mark of 0 on the Examination.

All applications for deferred and special examination arrangements must be made to the MFIN Program Office. Failure to meet the stated deadlines may result in the denial of these arrangements. Deferred examination privileges, if granted, must be satisfied during the examination period at the end of the following term. There will be one common sitting for all deferred exams.

Failure to write an approved deferred examination at the pre-scheduled time will result in a failure for that examination, except in the case of exceptional circumstances where documentation has been provided and approved. Upon approval, no credit will be given for the course, and the notation N.C. (no credit) will be placed on the student's transcript. Students receiving no credit for a required course must repeat the course. Optional or elective courses for which no credit is given may be repeated or replaced with another course of equal credit value.

Requests for a second deferral or rescheduling of a deferred examination will not be considered.

Any student who is unable to write a final examination because of illness is required to submit the Application for Deferred MFIN Final Examination and a statement from a doctor certifying illness on the date of the examination. The Application for Deferred MFIN Final Examination and the McMaster University Student Health Certificate can be found on the DeGroote website at https://mfin.degroote.mcmaster.ca/current-students/forms/

Students who write examinations while ill will not be given special consideration after the fact. In such cases, the request for a deferred examination privilege must be made in writing to the MFIN Program Office within five business days of the missed examination.

Special examination arrangements may be made for students unable to write at the posted exam time due to compelling reasons such as religious or representing the University at an academic event.

Students who have religious obligations which make it impossible to write examinations at the times posted are required to produce a letter from their religious leader stating that they are unable to be present owing to a religious obligation.

If a student is representing the University at an academic event and is available at an overlapping scheduled time of the test/examination, the student may write the test/examination at an approved location with an approved invigilator, as determined by the MFIN Program Office. In such cases, the request for a deferred examination privilege must be made in writing to the

MFIN Program Office within ten business days of the end of the examination period.

Note: A fee of $50 will be charged for a deferred exam written on campus and a fee of $100 for deferred exams written elsewhere.

In cases where the student's standing is in doubt, the MFIN Program Office may require that the student with one or more deferred examination privileges refrain from re-registering until the examination(s) have been cleared.

STUDENT ACCESSIBILITY SERVICES

Student Accessibility Services (SAS) offers various support services for students with disabilities. Students are required to inform SAS of accommodation needs for course work at the outset of term. Students must forward a copy of such SAS accommodation to the instructor normally, within the first three (3) weeks of classes by setting up an appointment with the instructor. If a student with a disability chooses NOT to take advantage of an SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. The SAS website is:

http://sas.mcmaster.ca

ACKNOWLEDGEMENT OF COURSE POLICIES

Your registration and continuous participation (e.g. on A2L, in the classroom, etc.) to the various learning activities of 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.

POTENTIAL MODIFICATIONS TO THE COURSE

The instructor and university reserve the right to modify elements of the course during the term. The university may change 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.

COURSE SCHEDULE

CL.	DATE	FINANCE CONTENT	EXCEL TOPIC
1	Fri. Jan 10	**Introduction** Intro to Financial Modelling	-
2	Fri. Jan 17	**Financial Statement Modelling I** Forecasting financial statements using spreadsheets	• Various Excel functions / tools
3	Fri. Jan 24	**Financial Statement Modelling II** Integrating financial statement worksheets, completing valuations	• Various Excel functions / tools
4	Fri. Jan 31	**Portfolio Modelling** Investment portfolios, betas, variances, performance measurement	• Datatables, arrays, pivot tables • Matrix operations
5	Fri. Feb 7	**Forecasting and Optimization** Macro forecasting, optimization techniques, predictive analytics	• Solver, Analysis Toolkit, Regression, Scenario analysis
6	(TBA)	*Term Test 1* – To Be Written on Campus	
-	Fri. Feb 21	*Midterm Recess (No Class)*	
7	Fri. Feb 28	**Financial Software Integration** Use with Bloomberg and third-party software	• *Using Bloomberg Terminals*
8	Fri. Mar 6	**VBA / Programming I** Intro to VBA / programming	• VBA, macros, custom functions
9	Fri. Mar 13	**VBA / Programming II** Working with custom functions	• VBA, advanced loops
10	Fri. Mar 20	**VBA / Programming III** Additional programming *Spreadsheet Assignment* due online by 11.00 AM on the following Monday	• User interfaces, additional VBA programming

CL.	DATE	FINANCE CONTENT	EXCEL TOPIC
11	Fri. Mar 27	**Introduction to Python** Fundamentals, key libraries *Project Proposal* due online by 11.00 AM on the following Monday	• Numpy, Pandas, Matplot
12	(TBA)	*Term Test 2* – To Be Written on Campus	
13	Online	*Review + Project Questions*	-
-	Mon. Apr 13	**Group Project** – Due by 11.00 AM	

RESEARCH DATA

Any research data obtained by a student from publicly available sources for the purposes of completing term work (including data used in assignments, projects, and tests) are the joint property of the student, the instructor, and the university. All parties are free to use the research data subject to the original copyright of such data. Students hereby agree not to use in their term work any proprietary data or data subject to copyright protection without the prior written approvals of the instructor and the owner of any such copyright.