# Commerce 3FD3
# Financial Modeling
# Fall 2022 Course Outline

## Finance and Business Economics Area
## DeGroote School of Business
## McMaster University

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## *INSTRUCTOR AND CONTACT INFORMATION*

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| C01: Mondays 14:30–17:20 | CO2: Friday 8:30-11:20 | CO3: Wednesday 08:30-11:20 | CO4: Monday 19:00-22:00 |
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Instructor**: Dr. Amir Akbari**
Email: akbara23@mcmaster.ca
Office Hours: Mondays, 11:00 to 12:00, or by appointment (DSB 309)

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| TA: | **Zi Yang** |
| Email: | **yangz242@mcmaster.ca** |
| Office Hour: | **TBA** |
| Location: | **TBA** |


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## *COURSE ELEMENTS*

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

## COURSE INFORMATION

**Lectures**: 3hr x1/wk
**Tutorials**: 1hr x1/wk (Live session) with TA
**Course Delivery Mode**: In-person
**Course Description**: *This three-credit elective undergraduate course provides an introduction to financial modelling with MS-Excel and Python. The main focus is on configuring and solving real-world applications in corporate finance and investments. By the end of this course, students will be able to use quantitative tools (such as spreadsheets and financial libraries/functions) to model problems on topics such as capital budgeting, firm valuation, portfolio management, and risk management.*

*Introduction to Finance (COMMERCE 2FA3 or IBH 2BB3) and registration in level III or above in any Honours Bachelor of Commerce or Engineering and Management program; or relevant minor is a prerequisite. Strong knowledge of statistics is highly recommended. Working knowledge of MS Excel is assumed, but no prior experience with Python is required.*

*Note: Non-Commerce students may enrol in specific upper-year Commerce courses if they have been accepted into a Specialized Minor offered by the Faculty of Business or can demonstrate that they are pursuing an interdisciplinary minor for which the specific Commerce courses are included.*

## IMPORTANT LINKS

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library

## COURSE LEARNING OUTCOMES

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

- Develop a conceptual framework to solve financial problems.
- Design a financial model.
- Build a financial model using the Python programming language and MS-Excel.

## *COURSE LEARNING GOALS*

Upon successful completion of this course, students will learn and understand the following key concepts:

- Learn to use advanced techniques for analyzing financial data, for purposes of managerial decision-making.
- Learn the basics of programming with the Python programming language.
- Learn to use various functions and libraries of the Python programming language and MS-Excel for financial applications.

## *REQUIRED MATERIALS AND TEXTS*

**Required**:

Course Materials are available on Avenue To Learn http://avenue.mcmaster.ca

Benninga; Financial Modeling; Fourth (4th) Edition; The MIT Press, 2014. ISBN: 978-0262027281. The textbook is a Finance-focused modelling text, also useful in other finance courses, that cover practical examples in finance in Excel.

**Optional:**

- Yves Hilpisch, Python for Finance: Analyze Big Financial Data, 2014. ISBN: 978-1491945285. The textbook is a hands-on guide that helps both developers and quantitative analysts get started with Python and guides you through the most important aspects of using Python for quantitative finance.
- Rosenbaum, J., Pearl, J., Investment Banking, (Second Edition – University Edition) Wiley, 2013. ISBN: 978-1-118-47220-0. The textbook focuses on the primary valuation methodologies that are widely used in the industry.

## *CLASS FORMAT*

The three hours of the class time will consist of mini-lectures, in-class problem-solving (hands-on assignments both with MS-Excel, and Python), and lengthier discussion of the topics.
There will be a short break at a convenient time based on the class progress. Please use this time to take care of personal needs of various kinds.

## *COURSE EVALUATION*

The grade will be calculated as the weighted sum of students' marks for their FIVE weekly assignments, TWO take-home midterm exams, class participation, and a final exam. The weights and description of each grade component are as follows:

| Grade Component | Description | Weight |
|---|---|---|
| **Weekly Assignments** | Time Value of Money, Capital Budgeting, Python, Risk and Return analysis, Asset Pricing | 10% |
| **Midterm 1** | Firm Valuation | 20% |
| **Midterm 2** | Portfolio Analysis | 20% |
| **Class Participation** | Active contributions to weekly discussion | 10% |
| **Final Exam** | Cumulative and Computer-based (in Python and Excel). Date to be determined | 40% |
| **Total** | | **100%** |

## *COURSE DELIVERABLES*

### *Weekly Assignments*

*There are five weekly assignments based on in-class examples. Each assignment has a 2% weight. The details of each assignment will be described at the end of sessions 2,3,7,8, and 11. Students are required to submit their assignments before the start of the next session (i.e. by weeks 3,4,8,9, and 12) on the course portal on the Avenue to Learn website. Students will be graded based on their effort and the quality of the presentation. Late assignments are NOT acceptable.*

### *Midterm #1 – Take-home Exam*

The first midterm exam has a 20% weight and is a take-home exercise on firm valuation. The details of the exercise will be described in class with at least a two-week notice. Students are required to submit their exams by week 6 on the course portal on Avenue to Learn website. The exam is to be done individually, NOT in collaboration with other students. Students will be graded based on the originality of their work, clarity of presentation and assumptions made (if applicable) and accuracy of the results. Late exams are NOT acceptable.

### *Midterm #2 – Take-home Exam*

The second midterm exam has a 20% weight and is a take-home exercise on portfolio analysis. The details of the exercise will be described in class with at least a two-week notice. Students are required to submit their exams by week 11 on the course portal on Avenue to Learn website. The exam is to be done individually, NOT in collaboration with other students. Students will be graded based on the originality of their work, clarity of presentation and assumptions made (if applicable) and accuracy of the results. Late exams are NOT acceptable.

### *Participation*

This class is full of class activities and student participation is an important component of this course. Class participation is graded by the following rubric. Passive attendance does NOT contribute to students' participation marks.

| Criteria | Excellent 10% | Average 7% | Unacceptable 4% |
|---|---|---|---|
| Verbal Contribution (Comments, Questions, explaining to classmates) | Exhibited all sub-criteria in a respectful manner, in small and large group discussions | Exhibited most of the sub-criteria in a respectful manner, but more so in small than in large groups or vice versa. | Verbalized rarely and only when solicited. |
| Focus and Attentiveness | Always aware of the topic or issue being discussed, consistently engaged in active listening strategies, and never engaged in activities that distracted others. | Almost always aware of the topic or issue being discussed and often engaged in active listening strategies. May have been distracted once or twice (bad day). | Always distracted or distracting (e.g., on the computer, talking to others, or doing work for other classes). |
| Level of engagement in our class learning community (Discussions, Group Activities, Paired Activities) | Always assumes shared responsibility for the quality of class activities. Advances the class by posting ideas about the readings and course materials. Engages other students in discussions by commenting on classmates' postings and/or asking for clarification. | Appears to be somewhat indifferent to the topics under discussion. Participates in an aloof way. | Occasionally engages others and/or responds to others in the class. |

### *Final Exam*

*The final exam will be cumulative, computer-based, and in-person. Students are required to make sure that Python and MS-Excel are running properly on their devices. The date of the final exam is to be set by the registrar's office.*

## *LATE ASSIGNMENTS*

Assignments and Take-home midterm exams are introduced in advance, giving students sufficient time to work on them. Therefore, late submissions are NOT acceptable.

## *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.

## *REQUESTING RELIEF FOR MISSED ACADEMIC WORK*

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work" and the link below;

http://ug.degroote.mcmaster.ca/forms-and-resources/missed-course-work-policy/

## *COURSE MODIFICATION*

From time to time, there may be a need to remove/add topics or to change the schedule or the delivery format. If these are necessary, you will be given as much advance notice as possible.

## *GENERATIVE AI*

Students may use generative AI throughout this course (up to the final exam) in whatever way enhances their learning; no special documentation or citation is required.

Use of this technology, however, during the final exam is PROHIBITED.

## *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. **It is your responsibility to understand what constitutes academic dishonesty.**

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. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy.

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

## *AUTHENTICITY/PLAGIARISM DETECTION*

**Some courses may** use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. Avenue to Learn, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

## *CONDUCT EXPECTATIONS*

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

## *Academic Accommodation of Students with Disabilities*

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

## *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 should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation 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.

## *Copyright and Recording*

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

## *Extreme Circumstances*

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn and/or McMaster email.

## *ACKNOWLEDGEMENT OF COURSE POLICIES*

Your enrolment in Commerce 3FD3 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.

## *COURSE SCHEDULE*

## Commerce 3FD3: Section C01/C04

| Week | Date | Topics | Readings | Due Dates |
|---|---|---|---|---|
| 1 | 11-Sep | Introduction to Financial Modelling | Chapters 31-35 | |
| 2 | 18-Sep | Time Value of Money | Chapters 1, 7 | |
| 3 | 25-Sep | Review of Financial Statements, Capital Budgeting | Teaching Notes<br>Chapters 1, 7 | Assignment 1 |
| 4 | 2-Oct | Stock Valuation | Chapters 2,4,5,6 | Assignment 2 |
| | 9-Oct | **Mid-term recess** | | |
| 5 | 16-Oct | Bond Valuation<br>Introduction to Python | Chapters 20 to 23<br>Teaching Notes | |
| 6 | 23-Oct | Python Libraries | Teaching Notes | Midterm 1 |
| 7 | 30-Oct | Python Libraries | Teaching Notes | |
| 8 | 6-Nov | Python Libraries | Teaching Notes | Assignment 3 |
| 9 | 13-Nov | Risk and Return | Chapters 8 to12 | |
| 10 | 20-Nov | Capital Asset Pricing Model | Chapters 8 to12 | Assignment 4 |
| 11 | 27-Nov | Extensions of CAPM<br>WACC | Teaching Notes<br>Chapters 3, 28 | Midterm 2 |
| 12 | 4-Dec | Monte Carlo Simulation | Chapters 24-27 | Assignment 5 |

*The topics covered in each session might be adjusted with the speed of class progress.

# Commerce 3FD3: Section C02

| Week | Date | Topics | Readings | Due Dates |
|---|---|---|---|---|
| 1 | 8-Sep | Introduction to Financial modeling | Chapters 31-35 | |
| 2 | 15-Sep | Time Value of Money | Chapters 1, 7 | |
| 3 | 22-Sep | Review of Financial Statements, Capital Budgeting | Teaching Notes<br>Chapters 1, 7 | Assignment 1 |
| 4 | 29-Sep | Stock Valuation | Chapters 2,4,5,6 | Assignment 2 |
| 5 | 6-Oct | Bond Valuation<br>Introduction to Python | Chapters 20 to 23<br>Teaching Notes | |
| | 13-Oct | **Mid-term recess** | | |
| 6 | 20-Oct | Python Libraries | Teaching Notes | Midterm 1 |
| 7 | 27-Oct | Python Libraries | Teaching Notes | |
| 8 | 3-Nov | Python Libraries | Teaching Notes | Assignment 3 |
| 9 | 10-Nov | Risk and Return | Chapters 8 to12 | |
| 10 | 17-Nov | Capital Asset Pricing Model | Chapters 8 to12 | Assignment 4 |
| 11 | 24-Nov | Extensions of CAPM<br>WACC | Teaching Notes<br>Chapters 3, 28 | Midterm 2 |
| 12 | 1-Dec | Monte Carlo Simulation | Chapter 24-27 | Assignment 5 |

*The topics covered in each session might be adjusted with the speed of class progress.

# Commerce 3FD3: Section C03

| Week | Date | Topics | Readings | Due Dates |
|---|---|---|---|---|
| 1 | 6-Sep | Introduction to Financial modeling | Chapters 31-35 | |
| 2 | 13-Sep | Time Value of Money | Chapters 1, 7 | |
| 3 | 20-Sep | Review of Financial Statements, Capital Budgeting | Teaching Notes<br>Chapters 1, 7 | Assignment 1 |
| 4 | 27-Sep | Stock Valuation | Chapters 2,4,5,6 | Assignment 2 |
| 5 | 4-Oct | Bond Valuation<br>Introduction to Python | Chapters 20 to 23<br>Teaching Notes | |
| | 11-Oct | **Mid-term recess** | | |
| 6 | 18-Oct | Python Libraries | Teaching Notes | Midterm 1 |
| 7 | 25-Oct | Python Libraries | Teaching Notes | |
| 8 | 1-Nov | Python Libraries | Teaching Notes | Assignment 3 |
| 9 | 8-Nov | Risk and Return | Chapters 8 to12 | |
| 10 | 15-Nov | Capital Asset Pricing Model | Chapters 8 to12 | Assignment 4 |
| 11 | 22-Nov | Extensions of CAPM<br>WACC | Teaching Notes<br>Chapters 3, 28 | Midterm 2 |
| 12 | 29-Nov | Monte Carlo Simulation | Chapter 24-27 | Assignment 5 |

*The topics covered in each session might be adjusted with the speed of class progress.