

FM3613B Course Outline

1. Course Information

Course Information

Course Name: Mathematics of Financial Options (FM 3613B)

Lecture Hours: Monday, Wednesday, Friday, 2:30 – 3:30 PM, in-person Room WSC240.

List of Prerequisites

Applied Mathematics 2402A or the former Differential Equations 2402A; or Statistical Sciences 2503A/B (or the former Applied Mathematics 2503A/B).

Unless you have either the requisites for this course or written special permission from the Department of Statistical and Actuarial Sciences to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

2. Instructor Information

Instructors	Email	Office	Office Hours
Dr. Marcos Escobar-Anel	Marcos.escobar@uwo.ca	WSC282	In-person, Wednesday 8-10 am.
TA: TBA			

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

An introduction to modern financial mathematics using a differential equations approach. Stochastic differential equations and their related partial differential equations. The Fokker-Planck and Kolmogorov PDEs. No-arbitrage pricing, the Black-Scholes equation and its solutions. American options. Exotic options.

Learning Outcomes. Upon successful completion of this course, students will be able to:

- Intuition about uncertainty and risk.
- The classical approach to decision making under uncertainty.
- Repaying loans over time.
- Bond pricing with default: using difference equations.
- Tranching and collateralized debt obligations.
- Mean-variance portfolio optimization.

- Capital Asset Pricing Model.
- Basic Stochastic Calculus.
- Black-Scholes equation.

Table of Contents and Schedule:

Week	Dates	Topic	Instructor
1	Jan 5 - 9	Probability, Risk and Uncertainty.	M. Escobar-Anel
2	Jan 12 - 16	Repaying loans over time.	M. Escobar-Anel
3	Jan 19 – 23	Bond Pricing with Default.	M. Escobar-Anel
4	Jan 26 – 30	CDO and Tranching. (Test 1)	M. Escobar-Anel
5	Feb 2 - 6	CDO and Tranching.	M. Escobar-Anel
6	Feb 9 -13	Mean Variance Portfolio.	M. Escobar-Anel
7	Feb 16 - 20	Reading Week	N/A
8	Feb 23 – 27	Mean Variance Portfolio. (Test 2)	M. Escobar-Anel
9	Mar 2 - 6	Capital Asset Pricing Model.	M. Escobar-Anel
10	Mar 9 - 13	Basic Stochastic Calculus.	M. Escobar-Anel
11	Mar 16 – 20	Basic Stochastic Calculus. (Test 3)	M. Escobar-Anel
12	Mar 23 – 27	Black-Scholes Formula.	M. Escobar-Anel
13	Mar 30 - Ap 3	Black-Scholes Formula.	M. Escobar-Anel
14	April 6 - 9	Review	M. Escobar-Anel

Classes begin: January 5, 2026

Spring Reading Week: February 14 – 22, 2026

Classes end: April 9, 2026

Exam period: April 12 – 30, 2026

4. Course Materials

Textbook (required): Quantitative Finance: A Simulation-Based Introduction Using Excel. Matt Davison. 978-1439871683 Textbook cost: \$156, see <https://www.amazon.ca/Quantitative-Finance-Simulation-Based-Introduction-Using/dp/143987168X> .

Supplemental: Instructor's course notes.

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

All course material will be posted to OWL: <https://westernu.brightspace.com/>

If students need assistance with the course OWL site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Midterm Exam 1: 15 % (week of 26/Jan)

Midterm Exam 2: 15 % (week of 23/Feb)

Midterm Exam 3: 15 % (week of 16/ March)

Final Exam 55 %

Midterm Tests:

There will be 3 tests during class, closed book, each containing two parts (multiple choice and short answer). Students will have 50 minutes to complete the test. Chapters and topics for the tests will be announced in advance through Brightspace.

Final Exam:

The final exam will be a three-hour cumulative examination. It will be scheduled by the Registrar's office (Examination period April 12 - 30, 2026).

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs*, posted on the Academic Calendar:

https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course.

Evaluation Scheme for Missed Assessments

No makeup test for Midterms. If you miss a test, the weight of the test(s) will be moved to the remaining exams.

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

If the make-up for the final is missed, the student will receive an INC and complete the task the next time the course is offered.

Rounding of Marks Statement

All students will be treated equally and evaluated based only on their actual achievement. *Final grades* on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

6. Additional Statements

6.1 Religious Accommodation

When a recognized religious holiday or observance conflicts with an examination, test, or other scheduled academic obligation, students must request accommodation via the University’s Student Absence Portal (SAP). This request should identify the conflict and specify which course component(s) (e.g. test, midterm, exam) are affected.

Students are encouraged to submit the SAP request as early as possible, but no later than two weeks before any examination, or one week before any mid-term test or quiz, to allow sufficient time for adjustment.

The SAP request serves as official notification to both the course instructor and the Academic Advising Office, in accordance with University policy:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

The Faculty of Science considers religious accommodations as scheduling conflicts. Instructors should provide either a make-up exam or an earlier sitting of the same exam to accommodate the student.

For more information on recognized religious holidays, please visit the Diversity Calendar posted on the Equity, Diversity & Inclusion website - <https://www.edi.uwo.ca>

6.2 Academic Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual’s official university email address.

It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences:

https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

6.5 Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.