COURSE OUTLINE
FM 9578A

1. Course information

Course name and number
Financial Modelling 9578A
Mathematics of Financial Options

Academic term
Fall 2023 (Sep - Dec 2022)

Time and day
8:30-11:30AM, Wednesday

Location
TC 205

List of prerequisites
Enrollment in a quantitative graduate program at UWO.

N.B.
Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor's information

Instructor: Dr. Rogemar S. Mamon
Contact Info: rmamon@stats.uwo.ca

Important
Students must use their Western (@uwo.ca) email addresses when contacting the instructor. Email messages from non-UWO account will NOT be read.

The subject of your email should have the format: **FM 9578 (insert "at most 4 words about your query")**; failure to do so will cause a delayed response. The instructor will endeavour to respond to email messages within 48 hours.

Office hours
Appointment is necessary. Wednesday, 12-2pm
WSC 209

3. Course syllabus, key sessional dates, and delivery mode

Course description: Background knowledge of linear algebra, multivariable calculus (e.g., limits, differentiation, integration, and Taylor series), elementary differential equations, and probability (e.g., discrete and continuous random variables, expectation and variance, and moment-generating function) will be assumed in this course.

Topics and coverage:
The goal of this course is to demonstrate the essential foundation of valuation and hedging of financial derivatives whose underlying variables follow discrete- and continuous-time stochastic processes. Financial instruments such as bonds, forwards, futures, European and American options, and their arbitrage relations will be discussed. Discrete-time stochastic models will be presented in the context of describing asset prices. The concept of no arbitrage pricing will be introduced and along with the related notion of replication of securities. The importance of martingales, risk-neutral valuation, and asset pricing theorems in discrete time will be highlighted. We shall examine the Cox-Ross-Rubinstein binomial model and its application to option valuation. In continuous time, an introduction to Brownian motion will be the main consideration. The Black-Scholes-Merton differential equation and its solutions will be discussed. Hedging parameters will be derived. Note that some of the above-mentioned topics may be less emphasised depending on time constraints.

Extra Information: 3 lecture hours

Key Sessional Dates:
Classes begin: 07 September 2023
Fall Reading Week: 30 October – 05 November 2023
Classes end: 08 December 2023
Exam period: 10 - 22 December 2023

Delivery mode: In-person setting

4. References

John Hull. Options, Futures, and other Derivatives. Pearson. (10th or 11th edition)

Cvitanic and Zapatero. Introduction to the Economics and Mathematics of Financial Markets. MIT Press, Cambridge Massachusetts.

5. Related course materials

Students should check OWL (http://owl.uwo.ca) 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. Students are responsible for checking OWL on a regular basis.

All course materials will be posted on the OWL website: http://owl.uwo.ca.

If students need assistance, they can seek support from the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

6. Methods of evaluation

The overall course grade will be calculated as listed below:

Assignment 1	**(Fri, 13 Oct 2023)**	**17.5%**
Assignment 2	**(Fri, 17 Nov 2023)**	**17.5%**
Final Exam	**(Mon, 11 Dec 2023)**	**65.0%**

The final exam will be held from 2-5pm.

Missed exams/tests

If you have a conflict, please contact me as soon as possible (and **prior** to the test). There will be no make-up tests. For those who legitimately miss a course requirement and provide the required supporting documentation, the standard practice will be that the weight of the missed course cmponent will be reassigned to the final exam.

7. Accommodation and accessibility

Accommodation policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf

Religious accommodation

Students should consult the University's list of recognised religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:
https://multiculturalcalendar.com/ecal/index.php?s=c-univwo

If a student fails to write a scheduled Special Examination in the case of a missed final exam with a valid excuse, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term may be reduced by the credit of the course(s) for which the final examination has been deferred. See Academic Calendar for details (under Special Examinations).

8. Academic policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Any **non-programmable calculators are permitted** during the exam; note that mobile phones and other electronic communication devices are **strictly prohibited.**

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

9. Support services

You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/. Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.