Western Science

COURSE OUTLINE
FM 9590A

1. Course information

Course name and number

Financial pre requisites for this course written special permission frissirequirements

Stable internet connection, computer with working microphone and/or webcam, Microsoft W
Excel.

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

Office hours
Appointment is necessary. Thursday, 1:45 – 3:00PM and Friday, 12:45 – 2:10PM, WSC 209

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

Course description: This course introduces the elements of stochastic calculus. The applications cover the analysis of fixed-income instruments and the stochastic modelling of financial and actuarial risk factors.

Topics to be covered

- ❖ Pertinent mathematical background in the development of stochastic integration with respect to Brownian motion. This includes the Gaussian process, variation of paths, stochastic integrals, Itô differentiation rule, Girsanov theorem (without proof), Feynman-Kac formula and Euler discretisation scheme for simulation.

- ❖ Martingale pricing results. Self-financing and replicating strategies. Equivalent martingale probability measure. Arbitrage theory. Market completeness.

- ❖ The theory of bond pricing. Analysis of diffusion-based term structure models such as the Vasiček, Cox-Ross-Ingersoll and Hull-White models. Exponential-affine class of interest rate models and other extensions. The forward rate approach of Heath, Jarrow and Morton. The forward measure. Relating the short-rate approach to the forward-rate approach.

NOTE: ***The relevant readings above are tentative, and they may be subject to modification. Any changes will be posted on the course website.***

Extra Information: 3 lecture hours

Key Sessional Dates:
Classes begin: 08 September 2022
Fall Reading Week: 31 October – 06 November 2022
Classes end: 08 December 2022
Exam period: 10 - 22 December 2022

Delivery mode: In-person setting

Contingency plan for an in-person class pivoting to 100% online learning
In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

4. Reference

Tomas Björk (2020). 4th edition. Oxford University Press, Oxford.

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

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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

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http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Tests and examinations in this course may be conducted using the remote proctoring service, such as Proctortrack. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**.

Alternatively, tests and examinations in this course may be conducted using Zoom. You will be required to keep your camera on for the entire session, hold up your student card for identification purposes, and share your screen with the invigilator if asked to do so at any time during the exam.

More information about these remote proctoring services is available in the Online Proctoring Guidelines at the following link:
https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for