

Applied Mathematics 3613a Mathematics of Financial Options
Fall Term (Sept – Dec) 2013
Course Outline

Instructor: Matt Davison, WSC 221, mdavison@uwo.ca 519-661-3621

Textbook: *An Excel- and Analytics-based Introduction to Financial Modelling*, by Matt Davison. Available from Instructor. We will cover Chapters 1-5, 7-9, 14-24, and 27.

Course webpage: TBA

Lecture Times: MWF 12:30 -1:30 PM, TBA

Office Hours: MW 9:30-10:30 and 2:30-3:30. You can also ask me questions, or set an appointment with me, by emailing me. Please email me from your uwo address to ensure that your message is not blocked by the university spam filter.

Brief Description

This course is on modern financial mathematics -- the study of making financial decisions under uncertainty. Such decisions are shaped by three main drivers – the balance between future and present, quantified by the interest rate; the role of uncertainty, often quantified in terms of the volatility, and investors attitudes toward risk. Several products are available to trade and manage risk: stocks and bonds at a basic level; forwards, futures, and options at a more advanced level. We will develop theories for pricing and hedging both individual securities and portfolios of them. By the end of the course we will understand two Nobel-prize winning economic theories – the Capital Asset Pricing Model of Markowitz, Sharpe, and Miller (Nobel Prize 1990) and the Black-Scholes-Merton theory of options pricing (Nobel Prize 1997). We will learn how to price and hedge a variety of stock options and briefly discuss the challenges involved in extending this pricing technology to options on other underlying assets. Along the way we will use mathematics ranging from basic stochastic calculus and linear differential equations to the asymptotic expansion of integrals. However, the mathematics will always be taught as a means to a goal and not as the goal itself – I will try to explain things in simple, financially motivated terms as much as possible.

Evaluation:

Weekly quizzes (10 minutes at the beginning of each Friday)	10%
Term Test I (Wed Oct 16, 7-9PM)	20%
Term Test II (Wed Nov 13, 7-9PM)	20%
Project or Essay (due last day of class; Fri December 6)	10%
Final Exam (in December final exam period)	40%

Addendum to all Applied Mathematics Course Outlines

1. **Plagiarism:** Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).
2. **Plagiarism Checking:** The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.
3. **Prerequisites for a course:** Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will 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.
4. **If computer-marked multiple-choice tests and/or exams are given:** Use may be made of software to check for unusual coincidences in answer patterns that may indicate cheating.
5. **Accessibility Statement:** Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.
6. **If you are unable to meet a course requirement due to illness or other serious circumstances,** you must provide valid medical or other supporting documentation to your faculty's Dean's Office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from your faculty's Dean's Office immediately. For further information please see:
<http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>
7. **A student requiring academic accommodation due to illness,** should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:
https://studentservices.uwo.ca/secure/medical_document.pdf