University of Regina
Statistics 441–Stochastic Calculus with Applications to Finance

Section: 001
Lecture: MWF 930–1020 in Classroom Building, room 408 (CL 408).

Professor: Michael Kozdron
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Office Hours: TBA.

Required Texts:

- Desmond J. Higham, *An Introduction to Financial Option Valuation*, Cambridge, 2004.

Course Description:
3 credits. Processes derived from Brownian motion; the Itô integral and Itô's formula; applications of Itô's formula in financial modelling, especially within the context of the Black-Scholes option pricing model. ***Prerequisite: STAT 351 with a grade of at least 60%.

Student Responsibilities:
Students should familiarize themselves with both the *Responsibilities of Students* in Section 5.1 and the *Responsibilities of Instructors* in Section 5.2 of the *Undergraduate Calendar*. Especially note item 7 which states that: Instructors are expected to conduct their courses in such a way as to obtain evidence of student writing skills, in term papers, essays, reports, or other written work, and to demand competence in writing for a passing grade

Keeping Up-to-Date:
This is an advanced course in stochastic processes applied to mathematical finance. Many of the assigned problems will be theoretical in nature requireing symbolic manipulation and rigorous, careful use of theoretical constructs. There will be some focus on proving major theorems, and students will be expected to understand the proofs which are presented in class. Laboratory sessions will be conducted on the use of MATLAB and a number of numerical exercises requiring MATLAB will be assigned. Consequently, it is vital that students read the appropriate textbook sections before and after each lecture, and attempt the relevant homework problems. A glance at the syllabus will reveal that there will be a lively pace kept. Keeping up-to-date with the material is essential!

Grading Information:
Your final grade will be determined by your performance in the course, including assignments, the midterm, and the final exam. Students should consult *Grading Descriptions* in Section 5.9.1 of the *Undergraduate Calendar* for an outline of the expectations associated with various percentage grades.

Evaluation Type	**Number**	**Percentage of Final Grade**
Assignments	10	25%
Midterm Exam	1	25%
Final Exam	1	50%

Caveat: Final grades are subject to (upward) adjustment based on superior performance on the final exam, and to (downward) adjustment due to class absences.

Policy for Missed Classes, Missed Midterm, and Missed Final Exam:
Students are expected to attend every class. Unexplained absences will not be tolerated. Students should familiarize themselves with the section *Deferrals* (Section 5.7) of the *Undergraduate Calendar*.

Assignments:
As is the norm in a university-level course, it is not possible to cover all of the required material in lecture. As a result, each student must take an active rôle in his or her own education. Mathematics and Statistics are not spectator sports. They cannot be learned passively only by watching the instructor lecture. Instead they must be learned by doing. Consequently, most of what you learn in this course will be the result of working exercises that are designed to reinforce key concepts, develop skills, and test your understanding of the material. Before you try working the exercises, however, do the reading assignment. Reading the text will help you review the important concepts before you start on the exercises. After each class meeting, you should work all problems assigned from the section discussed that class. Assignments will take on the average 10–12 hours. You are encouraged to talk with your classmates about the homework; you might even want to form a study group to work together on the most difficult homework problems. However, all problems you submit must be your own work. ***It is dishonest, and a serious University of Regina violation, to submit someone else's work as your own.***

Midterm Exam:
There will be one major midterm exam that will be given during the semester. The midterm will be closed-book, although one page of handwritten notes will be allowed. The exam will be comprehensive, and cover all the material listed on the syllabus before that midterm, including lectures, assigned readings, and assignments.

Final Exam:
As with the midterm exam, the final exam will be closed-book, although one page of handwritten notes will be allowed. The final exam will be comprehensive and cover all of the material listed on the syllabus, including both lecture work and assigned readings.

Exam Dates:
The midterm will be held in class during the usual class time, and the location of the final exam will be determined by the Registrar near the end of the term.

- Midterm Exam: **Wednesday, March 18, 2009, 930–1020**
- Final Exam: **Monday, April 20, 2009, 900–1200**

Academic Integrity:
For a university community of scholars, academic integrity is the heart of intellectual life—both in learning and in research.

Students should read carefully the University of Regina guidelines on *Student Behaviour* in Section 5.13 of the *Undergraduate Calendar*, and not assume they understand what integrity and cheating are and are not. Academic integrity most certainly implies more at the university than it did in high school. The standards of integrity are those that prevail in professional life. Students must acknowledge and cite ideas they adopt from others (not just direct quotations), and understand the general standards and policies of academic integrity, as well as specific expectations in individual courses. When in doubt, ask!

Students should also consult the pamphlet *Academic Integrity* published by the University Secretary, or contact that office for more information.