Department of Mathematics & Statistics
Concordia University

ACTU 256
Mathematics of Finance
Fall 2015

Instructor*: _____

Office/Tel No.: _____

Office Hours: _____

*Students should get the above information from their instructor during class time. The instructor is the person to contact should there be any questions about the course.

Course Examiner: Dr. E. Duma

Textbook: *Mathematics of Investment and Credit*, by Broverman, S. A., 5th Edition, ACTEX 2010.

Chapter 1 (excluding 1.2.1)
Chapter 2 (excluding 2.4.2 and 2.4.3)
Chapter 3 (excluding 3.2.1, 3.2.2 and 3.4)
Chapter 4 (excluding 4.3.2)
Chapter 5 (excluding 5.1.4 & investment year method portion of 5.3.1, 5.3.2 & 5.3.3)
Chapter 6 (excluding 6.2 and 6.4)
Chapter 7 (excluding 7.1.6 and 7.3)
Chapter 8 (8.1 only)

Outline: This course is an introduction to the mathematics of compound interest. The topics covered correspond approximately to the interest theory of Exam FM of the Society of Actuaries. The topics include (but are not limited to):

- *Measurement of Interest:* simple interest, compound interest, accumulation functions, present value, effective and nominal rates, forces of interest;
- *Equations of Value:* basic problem, numerical results, unknown time, unknown rate of interest;
- *Basic Annuities:* payments at a different frequency than interest is convertible, continuous annuities, varying annuities;

- *Amortization Schedules and Sinking Funds:* outstanding loan balance, varying series of payments, continuous payments;
- *Bonds and Other Securities:* types of securities, price of a bond, premium and discount, yield rates, callable bonds, serial bonds;
- *Yield Rates:* cash flow analysis, reinvestment rates, portfolio yield rate;
- *Applications and others:* modern financial instruments, inflation, duration, immunization, asset liability management, term structure of interest rates, other topics.

This course is accredited by the Canadian Institute of Actuaries (CIA). A grade of B or better in this course and inn FINA 385 is needed to apply to the CIA for the exemption of Exam FM.

The most recent detailed syllabus and learning objectives for Exam FM can be found at:
https://www.soa.org/education/exam-req/edu-exam-fm-detail.aspx

Course Evaluation:	- **Assignments:** counting for **10%** (each student should submit their assignments before the beginning of class on the announced due date). Solutions must be written up carefully, showing all work, for full credit. **NO LATE ASSIGNMENTS WILL BE ACCEPTED.**
	- Two mid-term exams: (scheduled tentatively for September 30th, 2015 and November 4th, 2015) counting for **41% (21% and 20% respectively)**, and
	- **One final exam:** counting for the remaining **49%.**

IMPORTANT:	<u>**THERE WILL BE NO SUPPLEMENTAL EXAM AND NO 100% OPTION FOR THE FINAL EXAM.**</u>
Calculators:	Only calculators approved by the Department or approved by the Society of Actuaries (SOA) are permitted in the class test(s) and final examination. The calculators approved by the department are the **Sharp EL 531** and the **Casio FX 300MS**, available at the Concordia Bookstore. See the current Basic Education Catalog for information on SOA approved calculators.

The list of calculators approved by the Society of Actuaries is here:
https://www.soa.org/Education/Exam-Req/Exam-Day-Info/edu-id-calculators. aspx