

**ACTU 256**  
Mathematics of Finance  
**Fall 2019**

**Instructor:** Dr. I. Cojocaru, Office: LB 1036 (SGW), Phone: 848-2424, Ext. 8656

**Text:** *Mathematics of Investment and Credit*, by Broverman, S. A., 6th Edition.  
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 7.3)  
Chapter 8: 8.1.1; 8.1.2; 8.1.3; 8.1.4; 8.1.5.  
Chapter 9: 9.1.

**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.

**CIA Accreditation:** This course is accredited by the Canadian Institute of Actuaries (CIA) under the University Accreditation Program (UAP). A grade of B+ or better in this course is needed to apply to the CIA for the exemption of Exam IFM. For more information click [here](#).

In addition to the university's internal policies on conduct, including academic misconduct, candidates pursuing credits for writing professional examinations shall also be subject to the Code of Conduct and Ethics for Candidates in the CIA Education System and the associated Policy on Conduct and Ethics for Candidates in the CIA Education System. For more information, please visit Obtaining UAP Credits and the CIA FAQ.

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% (students 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 **October 4th, 2019** and **November 8th, 2019**) counting for 41% (21% and 20% respectively), and **one final exam:** counting for the remaining 49%. There will be no make-up tests.

**IMPORTANT:** **THERE WILL BE NO SUPPLEMENTAL EXAM AND NO 100% OPTION FOR THE FINAL EXAM.**

**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>

#### **Academic Integrity and the Academic Code of Conduct**

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: [concordia.ca/students/academic-integrity](http://concordia.ca/students/academic-integrity)." [Undergraduate Calendar, Sec 17.10.2]