The University of Western Ontario - Department of Statistical and Actuarial Sciences

ACTUARIAL SCIENCE 2053

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Course Outline

Text Chapter Topic

1. Textbook

Course OWL Web Page

The web page will contain:

- 1. A copy of this course outline
- 2. Copies of exams from the previous year (with solutions)
- 3. Solutions to the exercises in the 8th edition of the textbook (as pdf files)
- 4. Weekly updates and information about the course that you need to know
- 5. Daily class notes (which will be incomplete to be filled in during the classes) and other things that are relevant to the course.
- 6. Assignments, about one week before the due dates
- 7. Online quizzes
- 8. Marks of quizzes, assignments, and exams as they are marked.

Course Objectives

This course is <u>not</u> intended to make you financial geniuses or to suggest what investments or insurance products you should be buying.

Instead, the objective of this course is to show you how you can do many useful financial calculations yourself, either using a calculator, pen and paper OR using a computer spreadsheet. Some of the calculations you will be able to do by the end of the course include:

- 1. Accumulating & discounting a single sum of money using either simple or compound interest
- 2. Accumulating & discounting a series of payments made at equal time intervals using compound interest
- 3. Calculating loan payments, including mortgage payments
- 4. Depreciating physical assets
- 5. Determining the rate of return on an investment
- 6. Determining the price of a bond or the rate of return on a bond
- 7. Understanding the yield curve and the risks involved with a fixed income investment

In the last part of the course you will be introduced to the fundamentals of financial calculations involving life contingencies. You will be able to:

- 1. Perform calculations involving probabilities of living or dying within a certain period of time
- 2. Calculate how much money you need at a certain age to purchase an annuity paying you a certain amount of money every year or every month for the rest of your life
- 3. Calculate the premium to be paid for a certain type of life insurance policy

Your ability to do all the above (and more) will be evaluated through written answer questions on the in-class quizzes and through a combination multiple choice/written answer questions on two tests and two exams.

APPROXIMATE Weekly Course Outline:

Week - 2020	Section			
Sept 9-11	Accumulating/discounting simple interest (sect 1.1-1.2)			
Sept 14-18, 21	Equations of value, partial payments, simple discount (section 1.3 to			
	1.5)			
Sept 23-25	Accumulating/discounting with compound interest, equivalent rates,			
	fractional periods (section 2.1-2.4)			
Online Quiz #1 – Sat, Sep 26 to Sun, Sep 27 (6pm to 6pm) – Chapter 1				
Sep 28-Oct 2	Determining the time and interest rate, equations of value, changing			
Oct 5-8	rates, other applications (section 2.5 to 2.10)			
Online Quiz #2 – Fri, Oct 9 to Sat, Oct 10 (6pm to 6pm) – Chapter 2				
Oct 9, 13-16	Ordinary annuities accumulated/present values (section 3.1, 3.2, 3.3)			
Oct 19-23	Ordinary annuities other annuities, determining rate/time (section			
	3.4, 3.5, 3.6)			
Oct 26-30	General annuities, mortgages, Perpetuities, (section 4.1-4.2-4.3)			
Online Quiz #3 – Sat, Oct 31 to Sun, Nov 1 (6pm to 6pm) – Chapter 3				
Nov 2-6	FALL READING WEEK			
Nov 9-11	Varying annuities (section 4.4)			
MIDTERM 1 – Saturday, November 14 10:00 am to 12:30 pm				
Nov 13, 16-20	Amortization Method, Outstanding balance, Refinancing, Sum of			
	digits (section 5.1, 5.2, 5.3, 5.4)			
Online Quiz #4 – Sat, Nov 21 to Sun, Nov 22 (6pm to 6pm) – Chapter 4				
Nov 23-25	Sinking Funds (sect 5.5/5.6/5.7)			

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.