

**UNIVERSITY OF WATERLOO**  
**Department of Statistics and Actuarial Science**  
**Actuarial Science 221**  
**Fall 2017**

*Introduction to Financial Mathematics (Non-Specialist)*

**Course Outline**

**Instructor:** Brent Matheson, MSc, MBA, CFA

**Office:** M3 2006

**Office Hours:** Posted weekly on my whiteboard.

**Telephone:** 519-888-4567 x 37212 (this is not the way to get me)

**Email:** [bmatheson@uwaterloo.ca](mailto:bmatheson@uwaterloo.ca)

**Learn Website:** log on through UW homepage. All communication and solutions, etc are through Learn.

**Time of Classes:** Monday, Wednesday & Friday, 2:30 am to 3:20 am., M3 1006

**COURSE DESCRIPTION AND OBJECTIVES:** ACTSC 221 is a course designed to provide students with the rudimentary mathematical knowledge necessary to pursue a career in financial services. It is highly practical with much of the material taken from real-life situations. The math covered in this course will prepare the student for courses in Corporate Finance, Investments, Intermediate Accounting, etc.

**Text:** Access through Learn site

**Assignments: 6 total (5 counted):** 10% total (top 5 marks count) – Through Learn

**Five (5) Quizzes – In class:** 40% total, 8% each, in-class time

**Final Exam:** 50%; cumulative **Note: you must pass the final exam to pass the course.**

**EXAMINATIONS:** There will be five quizzes and one final exam. The term tests will be written during normal class time on the scheduled dates. The final exam will be two and one-half hours duration and will be scheduled during the fall examination period. The final exam is comprehensive, covering material throughout the course. You must pass the final examination to receive a passing mark in this class.

You may use a non-graphing, financial calculator or other calculator containing  $\ln x$  and  $y^x$  functions. You are NOT allowed to use programmable or graphing calculators on exams. Bear in mind that marks on the examinations are allocated for complete setup of the solutions. If all you have is the final answer, it will get zero marks regardless of its validity.

Students must bring photo identification to the mid-term and final exams. Notwithstanding its relative weighting, students must pass the final exam in order to pass the course. If a student fails the final exam, the student's final mark will be the lower of the calculated grade according to the above weighting (i.e. including the final exam), and 48%.

If you have an illness that will impair your performance on an examination, do not write the examination. No adjustment will be made for medical reasons after a student writes an exam. However, note that the experience of virtually all UW instructors is students missing an exam for any reason almost always perform worse than if they had attended all exams.

An examination missed without adequate documentation will result in a grade of zero for the exam. No makeup examinations will be given under any circumstances. If a midterm examination is missed for a valid reason such as sickness or an emergency, the weight of the midterm exam will be added to the final examination. In the event that a student is unable to sit a final exam during its regularly scheduled time, provided there is a satisfactory basis for the absence with appropriate supporting evidence, the student will normally write the final exam when final exams take place for the next offering of the course. The student will initially receive an INC grade for the course and no numeric grade will be provided until such time as the final exam is written and a final grade calculated.

Re-grading requests should be made within **one week** after the return of the graded examinations. A regrading

request after a due date will not be accepted. The instructor reserves the right to re-grade the entire examination. Appeals will only be considered where the total marks involved are 5% or more of the total available marks on the exam, because marks below the 5% cut-off do not materially affect the final course grade. Final exam grade appeal procedures are consistent with overall University policy.

**ASSIGNMENTS:** Student success is highly correlated with ongoing preparation. There will be 6 assignments and each are weighted equally. In total, they count for 10% of your total grade. The top 5 are counted for your mark. You may do them as many times as you wish and the highest mark is counted for each. These are accessed through Learn.

Assignment Schedule		
Assignment #	Due Date: 5 PM	Day
Assignment 1	26-Sep-17	Tuesday
Assignment 2	5-Oct-17	Thursday
Assignment 3	24-Oct-17	Tuesday
Assignment 4	7-Nov-17	Tuesday
Assignment 5	21-Nov-17	Tuesday
Assignment 6	4-Dec-17	Monday

**LEARN COURSE WEBPAGE:** Course-related information/materials such as course outlines, lecture notes, solutions, and class announcements will be available on the LEARN website (<https://learn.uwaterloo.ca/>). It is students' responsibility to download posted course materials and check for updates.

**EMAIL POLICY:** The instructor will use students' emails as a major way for out-of-the class communication (e.g. making some announcements, answering some common questions, etc.). The LEARN group email list will be used for sending out class emails. Students should make sure that they can get their emails via LEARN group email. To communicate with the instructor via e-mail, use **bmatheson@uwaterloo.ca**.

**PROFESSIONAL CONDUCT POLICY:** To foster a more professional learning environment and to develop habits that lead to success in the business work, all participants must engage in professional behavior, including: 1. No inappropriate talking in class. 2. Turn off mobile phones prior to class. 3. Arrive on time and leave at the designated time. Please do not leave the class in the middle unless it is absolutely essential. 4. Plan outside activities to avoid conflicts with the activities outlined in the syllabus. 5. Agree to abide by the academic misconduct rules and procedures and code of ethics discussed below. 6. Acknowledging the importance of clarity of expression in written and oral communication and understanding that the course grade will be affected by your ability to communicate.

**ACADEMIC INTEGRITY:** Absolutely no cheating is allowed. Note on avoidance of academic offences: All students registered in the courses of the Faculty of Mathematics are expected to know what constitutes an academic offense, to avoid committing academic offenses, and to take responsibility for their academic actions. When the commission of an offense is established, disciplinary penalties will be imposed in accord with Policy #71 (Student Academic Discipline). For information on categories of offenses and types of penalties, students are directed to consult the summary of Policy #71 in the student Academic Calendar (Section 1) or by using the link below: <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>. Other resources regarding the discipline policy include your academic advisor.

**RELEASE OF GRADES:** Grades will be released through the course site on UW-Quest. Please note that University of Waterloo Policy 19 states that, "final examination and final course grades shall not be posted before the final examination period ends." I will not release marks through email or on the phone.

**DISABILITIES ASSISTANCE** The Accessibility Office is located in Needles Hall, Room 1132 and collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the office at the beginning of each academic term.

**ACTSC 221 Tentative Schedule Fall 2017**

<b>Day</b>	<b>Date</b>	<b>Lecture #</b>	<b>Topic</b>	<b>In-Class Test</b>
Friday	8-Sep-16	1	Intro/Simple Interest	
Monday	11-Sep-16	2	Compound Interest	
Wednesday	13-Sep-16	3	Nominal Rates/Changing Rates	
Friday	15-Sep-16	4	Equations of Value	
Monday	18-Sep-16	5	Solving for Time and Rate	
Wednesday	20-Sep-16	6	Rates of Discount/T-Bills	
Friday	22-Sep-16	7	Inflation/Taxes	
Monday	25-Sep-16	8	Simple Annuities	
Wednesday	27-Sep-16	9	<b>No Lecture - TT1</b>	Interest
Friday	29-Sep-16	10	Present Value of Annuities	
Monday	2-Oct-16	11	Solving for Rate and Number of Payments	
Wednesday	4-Oct-16	12	Annuities with Alternate Focal Points	
Friday	6-Oct-16	13	Review	
Monday	9-Oct-16	<b>Thanksgiving</b>	<b>No Lecture</b>	
Wednesday	11-Oct-16	<b>Study Day</b>	<b>No Lecture</b>	
Friday	13-Oct-16	14	<b>No Lecture - TT2</b>	Simple Annuities
Monday	16-Oct-16	15	General Annuities Intro/Mortgages in Canada	
Wednesday	18-Oct-16	16	Perpetuities	
Friday	20-Oct-16	17	Annuities where Payments Vary	
Monday	23-Oct-16	18	Review	
Wednesday	25-Oct-16	19	Amortization	
Friday	27-Oct-16	20	<b>No Lecture - TT3</b>	General Annuities
Monday	30-Oct-16	21	Outstanding Balance; Refinancing - Amortization	
Wednesday	1-Nov-16	22	Sinking Funds	
Friday	3-Nov-16	23	Sinking Fund Retirement of Debt	
Monday	6-Nov-16	24	Review	
Wednesday	8-Nov-16	25	Bonds - Terminology; Pricing	
Friday	10-Nov-16	26	<b>No Lecture - TT4</b>	Debt Repayment
Monday	13-Nov-16	27	Premium and Discount	
Wednesday	15-Nov-16	28	Price Between Coupon Dates	
Friday	17-Nov-16	29	YTM/Other Bonds	
Monday	20-Nov-16	30	Review	
Wednesday	22-Nov-16	31	NPV/IRR	
Friday	24-Nov-16	32	<b>No Lecture - TT5</b>	Bonds
Monday	27-Nov-16	33	Rate of Return - DW	
Wednesday	29-Nov-16	34	Rate of Return - TW	
Friday	1-Dec-16	35	Review	
Monday	4-Dec-16	36	Review	