

University of Toronto
Department of Statistical Sciences

ACT240 – Mathematics of Investment and Credit

(Summer 2021)

Instructor: Sebastian Calcetero (sebastian.calcetero@mailutoronto.ca)

Teaching Assistants: Jessie Wu (hanzhi.wu@mail.utoronto.ca)

Raj Patel (rajg.patel@mail.utoronto.ca)

Lectures: Monday & Wednesday, 7 – 9pm, delivered online via Bb Collaborate on Quercus site. This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. All the possible updates regarding to this course will be made in class and on Quercus.

Instructor Office Hour: Monday, 9-10 pm (immediately after the lecture times), delivered online via Bb Collaborate on Quercus site. I will stay in the Bb Collaborate after the lecture until there are no more questions, or at most 1 hour after. I will answer the questions in public, but if you have a private question, please send me a private chat in Bb Collaborate and I may either send you private chats in response, or create a breakout room for us to have a private chat. Please be patient and considerate, as there may be students in queue before you.

Tutorials: Monday & Wednesday, 6-7pm (right before the lecture), delivered online via Bb Collaborate on Quercus site. All tutorials will be recorded. Please note:

(1) The first tutorial is on May 3th (the first day of classes), and the last tutorial is on June 14th.

(2) The attendance to tutorials is not mandatory. TAs may go over some practice questions, and they may leave time for you to ask your questions. So you can view a part of the tutorials as a semi-group office hour with your TA.

Piazza: TAs will be answering questions in Piazza during the week. No questions will be answered on weekends, so try to post your questions on weekdays only.

Course Description:

Welcome to ACT240, your first actuarial science core course. In this course we will study the Theory of Interest, including discount and present values, determination of prices of annuities, mortgages, bonds and equities, loan amortization, yield rates on investments, etc. In addition to learning standard textbook materials, we will also apply them in real-life scenarios, such as payday loans, stock pricing, residential mortgage and pension, etc.

Note: This course is for students working to enter actuarial science major or specialist program. For other students interested in similar course material, please enroll in ACT230 Mathematics of Finance for Non-Actuaries. In addition, in order to enroll in any 300- or 400-level ACT course, a minimum grade of 63% must be obtained in each of ACT240, ACT245 and ACT247.

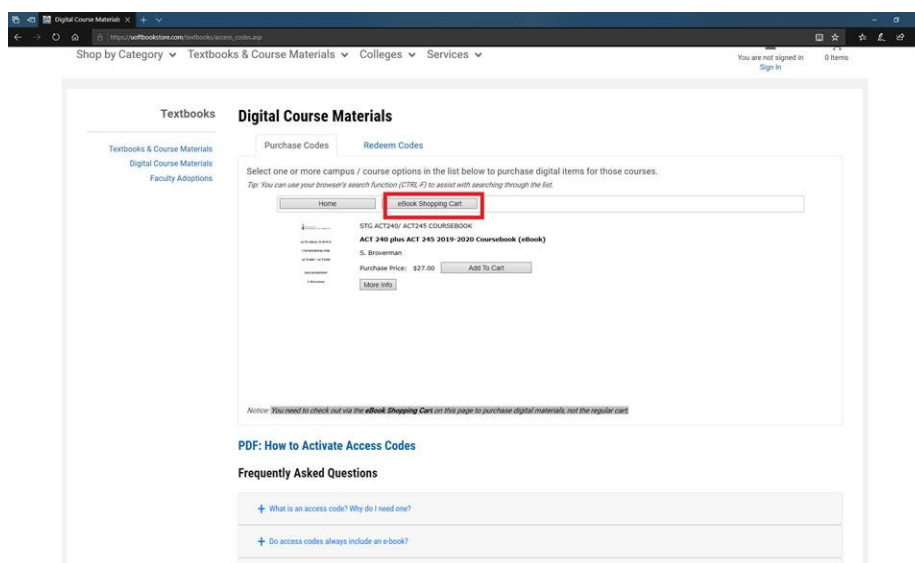
Textbook:

The main textbook is the digital version of Broverman course book for ACT240+ACT245. We have made that available for online purchase through the UofT bookstore website. Please follow these instructions to directly purchase your coursebook:

Navigate to the Digital Course Materials section on the University of Toronto Bookstore Website at https://uoftbookstore.com/textbooks/access_codes.asp

From here, scroll down the list and select your course, which appears as: *STG ACT 240/245 Coursebook*

Follow the instructions to purchase and download your code. You will need to check out via the eBook Shopping Cart on the page to purchase digital materials, not the regular cart. See screenshot below.



Calculator:

You need one of the following SOA-approved calculators: battery or solar-powered Texas Instruments BA-35 model calculator, the BA II Plus, the BA II Plus Professional, the TI-30Xa or TI-30X II (IIS solar or IIB battery), or TI-30X MultiView (XS Solar or XB Battery).

Course Evaluation:

You will require a reliable internet connection to complete the weekly quizzes, term tests and final assessment. All quizzes and exams will be held using the Quizzes tool on Quercus.

	Weight	Details
Weekly Quizzes	15%	6 quizzes in total on Fridays through Quizzes function on Quercus. The lowest score will be dropped.
Exam 1	25%	May 19, through Quizzes function on Quercus.
Exam 2	25%	June 7, through Quizzes function on Quercus.
Final assessment	35%	TBA.

Each quiz will consist of 2 questions related to the topics covered in the lectures in that same week. The questions will be very similar to examples in the lecture and exercises in the study manual. These are low-stake formative assessments to make sure you are constantly working in the course. There will be a practice quiz that will help you to get familiar with the Quizzes function in Quercus.

The weekly quiz will become available on Quercus from 10am on Fridays, and I will leave the quiz window open until midnight. Once you have started the quiz, you'll have 30 minutes to complete it (each question should take less than 10 minutes, but more time is provided in case you encounter a minor tech failure). At the end of the term, I will drop the lowest grade of your 6 quizzes.

More information about the structure and content of the exams will be provided in class or Quercus later on the term, at least one week before each examination.

Re-Marking:

Any requests to have your work remarked must contain a detailed written justification. Remarking requests should be emailed to the instructor within one week of receiving your mark. Note that adjustments in marks could equally result in a lowering or raising of the mark. When appealing a re-evaluation decision, the student accepts this condition.

Missed Quizzes and Tests:

The following rules will be strictly enforced, and no exception will be made.

1. Quizzes: There are no make-up quizzes, and no marks will be given to missed quizzes.
2. Exams:
 - o If you miss one exam due to valid reasons, either Exam 1 OR Exam 2, you must notify the instructor **via email by the end of the day immediately after the missed examination**. Also, you must use the Absence Declaration area in ACORN to formally declare the absence to the University. The exam weight will be shifted proportionally to the final assessment and the quizzes associated with the topics of the missed exam.
 - o YOU ARE NOT ALLOWED TO MISS MORE THAN ONE TEST. Students who miss both term tests will lose automatically 25% of the final mark and the remaining 25% will be shifted proportionally to the final assessment and the quizzes.

Online Format:

The following special arrangements are made because of the online format:

- Time Zone Issues: All course schedules are based on Toronto local time (GMT -5). If you live in a **significantly different time zone**, you should notify the instructor by email **on or before May 5 (Toronto Time)** for potential special arrangements for examinations.
- Technical Failures: If you encounter any technical failures (power outage, internet failure, etc.) during or right before any online assessments, you should notify the instructor by email at the earliest possible time with details of the incident.
- Course material: Course videos and materials belong to your instructors or the University, and are protected by copyright. In this course, you are permitted to download session videos

and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructors. For questions about recording and use of videos in which you appear please contact your instructor.

Tentative Schedule (subject to modification):

Week	Date	Course Content
1	May 3 (Mon)	-Course orientation; Introduction to simple/compound interest. - Readings: Section 1.
	May 5 (Wed)	Nominal rates of interest and discount. - Readings: Section 2.
2	May 10 (Mon)	Force of interest; Inflation; Risk of Default. - Readings: Section 3.
	May 12 (Wed)	Annuity immediate/due; and valuation at any time point. - Readings: Section 4 & 5.
3	May 17 (Mon)	Annuities with different interest and payment periods. - Readings: Section 6.
	May 19 (Wed)	- Quick review for E1 and last minute questions in the Tutorial. - Exam 1 (25%): 7:30pm-9:00pm EST
4	May 24 (Mon)	Victoria Day: No class.
	May 26 (Wed)	Annuities with arithmetic/geometric payments. - Readings: Section 7 & 8.
5	May 31 (Mon)	Loan amortization. - Readings: Section 9. June 1: Drop date
	June 2 (Wed)	Bond valuation. - Readings: Section 10.
6	June 7 (Mon)	- Quick review for E2 and last minute questions in the Tutorial. - Exam 2 (25%): 7:30pm-9:00pm EST
	June 9 (Wed)	Bond amortization. - Readings: Section 11.
7+	June 14 (Mon)	Measurements of the rate of return on a fund. - Readings: Section 12.
	June 17 - 28	Final assessment (35%): Time TBA. Covers everything.

Accessibility Services:

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach the instructor and/or Accessibility Services at 416-978 8060; studentlife.utoronto.ca/as.

Academic Integrity:

Academic integrity is fundamental to learning and scholarship at the University of Toronto. All assessments in this course are “open-book” in nature (i.e. you can consult your coursebook and your lecture notes). However, all work must be done by yourself, without help from others. Receiving help from anyone on an assessment, whether they are another student in the course or someone external to the course, is a serious academic offense. Providing help to another student in the course on an assessment is an equally serious academic offense. Posting or distributing questions from assessments is not permitted at any time.

Please further familiarize yourself with the University of Toronto’s Code of Behavior on Academic Matters available at <http://academicintegrity.utoronto.ca>, or you may also look at <https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity>.

Lead a Recognized Study Group (RSG) for this course

Apply now to be an RSG Leader for this course. RSGs are peer-led study groups of up to 8 students enrolled in the same A&S course.

Volunteering to be an RSG Leader is a great way to:

- Make friends in your courses
- Gain new leadership and group-facilitation skills
- Increase your understanding of course material
- Prepare for test and exams
- Boost your resume
- Earn a Co-Curricular Record (CCR) credit

This Fall, over 1,000 students volunteered to be an RSG Leader. Volunteer to be an RSG Leader this term with the support and training of Upper-year Arts & Science students! No experience is necessary.

[Sign up to be an RSG Leader now.](#)

Looking to join an RSG? RSGs for this course will be available to join starting May 10, 2021 on the [Sidney Smith Commons Online](#).

Find more information, visit: <https://uoft.me/recognizedstudygroups> or [@sidneysmithcommons](#)
Looking for more ways to study with other students? Join [Meet to Complete](#), daily study-with-me sessions just for Arts & Science students!

Canadian Institute of Actuaries (CIA)'s University Accreditation Program (UAP)

ACT240 is an accredited course under the UAP program. The minimum grade needed to apply for an exemption is 70. For detailed information on UAP, please visit the following webpages:

- University Accreditation Program description (<http://www.cia-ica.ca/membership/uap>)
- List of accredited courses offered by University of Toronto: <http://www.cia-ica.ca/membership/uap/accredited/toronto>
- How to apply for CIA exemptions: <http://www.cia-ica.ca/membership/uap/information-for-students>

Note: The CIA will grant credits to students for SOA/CAS examinations based on the achievement of the minimum Grade towards Associateship (ACIA) and Fellowship (FCIA) in the CIA. At the time of this agreement, CIA credits are recognized by the following actuarial organizations towards their respective designations:

Casualty Actuarial Society (CAS): ACAS, FCAS

UK Institute and Faculty of Actuaries (IFoA): FIA, AIA

Institute of Actuaries of Australia (IAA): AIAA, FIAA

Actuarial Society of South Africa (ASSA): AMASSA, FASSA

American Academy of Actuaries (AAA): MAAA

The CIA does not guarantee that credits granted to students under the CIA UAP will be recognized by any other actuarial organizations towards their actuarial designations.