

ACT350 H1F - APPLIED PROBABILITY FOR ACTUARIAL SCIENCE

Lecture: Tuesday 13:00 — 16:00, online
Instructor: Prof. Silvana Pesenti, Hydro Building 9105
silvana.pesenti@utoronto.ca
Office Hours: online; by appointment only.
Teaching Assistants: Kathleen Miao

Course description: The course offers an introduction to probability theory and stochastic processes. The main goal of the course is to help actuarial students understand the concept of stochastic processes with particular emphasis on Markov chains which are of great importance in Life Contingencies and Property and Casualty insurance. Specifically, the course will cover:

- conditional probabilities and expectations
- Poisson processes
- discrete-time and continuous-time Markov chains
- simulation of stochastic processes

Prerequisite: ACT240H1 (minimum grade 63%); ACT245H1 (minimum grade 63%); ACT247H1 (minimum grade 63%); STA257H1; MAT223H1/MAT240H1, MAT237Y1/MAT257Y1 (preferable).

Course materials: The course is based on the book *Stochastic processes* by Sheldon M. Ross, 2nd ed., ISBN: 978-0-471-12062-9; available in the bookstore.

Academic integrity: We adhere to the Academic Integrity policy of the University of Toronto, accessible on the course homepage of Quercus and the U of T homepage.

Course outline: The lectures will be pre-recorded and made available on Quercus. There will be live sessions every Tuesday starting at 13.00 via Zoom (Zoom link available on Quercus). These live sessions also include time for Q&A's. As the length of these live sessions are variable, please join at 13.00.

In the weeks indicated below there will be either tutorials or computer lab. Week number 1 corresponds to the week of the first lecture. If the current health situation allows, Tutorials and Computer lab will be in person.

Week No.	Date	Tutorials (T) / Lab (L)	Location	Time
week 2	21.09.2021	T	online	15.10-16.00
week 4	05.10.2021	T	in person	15.10-16.00
week 5	12.10.2021	L	in person	14.10-16.00
week 6	19.10.2021	T	in person	15.10-16.00
week 7	26.10.2021	T	in person	15.10-16.00
week 8	02.11.2021	L	in person	14.10-16.00
week 9	Reading week: no lectures or tutorials			
week 11	23.11.2021	T	in person	15.10-16.00
week 12	30.11.2021	T	in person	15.10-16.00

Grading scheme (detailed in the table below):

Assessment	Due date	Grade count
Quiz 1	Saturday 2. Oct.	3%
Quiz 2	Saturday 16. Oct.	3%
Group Project 1	Sunday 31. Oct.	22%
Group Project 2	Sunday 28. Nov.	22%
Quiz 3	Saturday 4. Dec.	3%
Final exam	TBC	47%
		100%

Quizzes: The quizzes are done directly through Quercus. They will take place on Saturday's in the weeks 3, 5, and 11. You will have a limited time for each quiz, however, each quiz will be available the entire Saturday (24hours). There is only one attempt per quiz.

Group Project: The project may include both theoretical questions as well as implementations in the programming language R. Group projects will made available on Thursday 21. Oct and Thursday 18. Nov, respectively.

Missed quizzes and projects: There will be no make-up tests for quizzes. Missed quizzes will have their grading weights shifted to the final exam. Missed project due to illness requires a [University of Toronto Student Medical Certificate](#), completed by a doctor, and handed in to the course instructor within one week of the assessment's deadline date. A missed project, with an under U of T guidelines *accepted* reason, will have their grading weights shifted to the final exam. If 25% or more of the total course grade count is missed (e.g., one project and one quiz) there will be a minimum of a 30 minutes oral mark-up exam.

Late penalty policy of projects: Late submission of projects will have a grade deduction of 10% per day of late submission.

Communication: Announcements will be given during lectures or through Quercus; messages through the Inbox of Quercus will not be responded.

For any questions about the course content including assessments, please come to my office hours. Emails to the instructor need be from a U of T address and should only be of private matters (e.g missed tests, ...).