

ACTU 457 (MAST 724), Sec. A
Risk Theory
Winter 2019

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Class Schedule: Tuesday-Thursday, 10:15-11:30, Room MB S2.210 SGW.

Outline: Risk theory forms the core part of Property-Casualty Insurance mathematics. The course gives an introduction to classical models and applies them to some common problems of interest in risk theory.

The emphasis is on the probabilistic aspects (stochastic processes) although some estimation (inference) questions will also be discussed. The topics include (**but are not limited to**) aggregate risk models, homogenous and non-homogenous discrete-time Markov chain models, Poisson processes, coinsurance, effects of inflation on losses, risk measures (VaR, TVaR). The course prepares for the Risk Theory portion of Exams C of the Society of Actuaries and Exam 4 of the Casualty Actuarial Society. A grade of B or better is needed to apply to the Canadian Institute of Actuaries for exemption of Exams C/4.

Text: "Loss Models", S.A. Klugman et al., Wiley, New York, 2012, 4th Edition.

Other Texts: "Actuarial Mathematics", N.L. Bowers et al., 2nd Edition, Society of Actuaries, Schaumburg, Illinois, 1997. Chapters 1-2, 13-14.

"Non-Life Insurance Mathematics", E. Straub, Springer-Verlag, New-York, 1988 (U/G - Theoretical),

"Practical Risk Theory for Actuaries", C.D. Daykin et al., Chapman & Hall, 1994 (U/G - Practical),

"Stochastic Processes for Insurance and Finance", T. Rolski et al., Wiley, 1999 (Graduate-Theoretical).

"Non-Life Insurance Mathematics", T. Mikosch, 2nd Edition, Springer-Verlag, Berlin, 2009 (Graduate - Theoretical).

Calculators: The only calculators allowed in tests or at the final exam for this course are those allowed at SOA/CAS exams: the Texas Instrument calculator models BA-35, BA-II Plus, BA-II Plus Professional Edition, TI-30XS MultiView, TI-30Xa, TI-30XIIS, TI-30XIIB or TI-30XM MultiView. This rule will be strictly enforced.

Assignments: There will be three assignments, to be handed in class at the beginning of the lectures in specific weeks (mentioned in class). These will count 10% towards your final grade. Students are encouraged to work in groups of **at most 2** members. Only one assignment is handed in per group. **Graduate students are required to complete all assignments individually.**

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

Tests and Final: There will be one class mid-term test in the seventh week of classes counting for 40% of your final mark and a final examination counting for the remaining 50% and scheduled by the University Examinations Office during the regular examination period in April. **There is no option for a 100% final or supplemental exam.** The grading scheme used to convert percentage marks into corresponding letter grades is given at the following webpage <http://www.concordia.ca/artsci/math-stats/programs/grading.html>, then to convert letter grades to a Grade Point Average (GPA) see the formula at <http://www.concordia.ca/academics/undergraduate/calendar/current/sec16/16.html#b16.3.11> under article 16.3.11.

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://www.concordia.ca/students/academic-integrity)." [*Undergraduate Calendar, Sec 17.10.2*]