Department of Mathematics and Statistics
Concordia University

> **ACTU 457 (MAST 724)**
> Risk Theory
> *Winter 2015*

Instructor: Dr. J. Garrido, Office: LB 921-21 (SGW), Phone: 514-848-2424, Ext. 3252
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Course Website: on Moodle

Class Schedule: Tuesday-Thursday, 10:15-11:30 in H-521, SGW Campus.

Office Hours: Tuesdays: 14:00-16:30, or by appointment.

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. Chapters 1-9.

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 exams for this course are the battery- or solar-powered Texas Instrument calculators, models BA-II Plus*, BA-II Plus, TI-30X, TI-30Xa (the official CAS calculator) or TI-30X II*. This rule will be strictly enforced.

Assignments: There will be four assignments, to be handed in class at the beginning of the Tuesday lectures in weeks 3, 6, 10 and 12. These will count 10% towards your final grade. Students are encouraged to work in groups of up to *two* members. Only one assignment is handed in per group.

Exams: A midterm will be held in class on February 19 (week 7) and will count for 40% of your final mark. A three-hour final will be held during the examination period in April and will count for the remaining 50%. **There is no option for a 100% final.** The grading scheme used to convert percentage marks into corresponding letter grades is given at the following webpage http://www.mathstat.concordia.ca/resources-and-links/student-resources/grading-system/index.php, then to convert letter grades to a Grade Point Average (GPA) the formula used can be seen at http://www.concordia.ca/academics/undergraduate/calendar/current/sec16/16.html#b16.1.10 under article 16.3.11.