Department of Mathematics & Statistics
Concordia University

ACTU 458 (MAST 725/MAST 881), Sec. D

Credibility Theory

Fall 2025

Instructor: Dr. Y. Lu
Email: yang.lu@concordia.ca
Course webpage: on Moodle.

Office Hours: Tuesdays & Thursdays, 11:30-15:00.

Class Schedule: Tuesdays-Thursdays, 10:15-11:30 am (mid-term break October 11-17).

Goal: The course presents an introduction to property and casualty insurance ratemaking. It is the natural continuation of Risk Theory, which discusses the probabilistic aspects of insurance portfolios.

In the first part of the course, two approaches to credibility theory are discussed: limited fluctuations and greatest accuracy. Topics covered include American, Bayesian, and exact credibility. Bühlmann, Bühlmann-Straub credibility models are also derived. The second part of the course will be a non-technical introduction to property and casualty insurance, including rate making and reserving methods.

The course prepares for the Credibility part of the Society of Actuaries Exam STAM and the Casualty Actuarial Society Exam MAS II.

In addition to the university's internal policies on conduct, including academic misconduct, candidates pursuing credits for writing professional examinations shall also be subject to the Code of Conduct and Ethics for Candidates in the CIA Education System and the associated Policy on Conduct and Ethics for Candidates in the CIA Education System. For more information, please visit Obtaining UAP Credits and the CIA FAQ.

Text: *Loss Models, From Data to Decision,* by S.A. Klugman, H.H Panjer, and G. E. Willmot, Wiley, 5th Edition, 2019. Online version available on the University Library website (you can also use the 4th Edition, 2012).

Other References: Introduction *to Ratemaking and Loss Reserving for Property and Casualty Insurance,* 4th Edition, by R.L. Brown, Actex 2015. A digital version will be uploaded to the Moodle course page.

Assignments: There will be 5 assignments counting for a total of 20% of the final mark. Assignments should be submitted as PDF files to the Moodle site. Solutions must be written up carefully, showing all work for full credit. No late assignments will be accepted. 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 mid-term test during lecture time on **Tuesday, October 21** (after the mid-term break) counting for 30% of the final mark and a final examination counting for the remaining 50% and scheduled by the University Examinations Office during the regular examination period in December.

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.

NOTE: It is the Department's policy that tests missed for any reason, **including illness,** cannot be made up. If you missed the midterm because of illness (to be confirmed by a **valid medical note),** the final exam can count for 80% of your final grade and 20% will be contributed by the assignments.

PLEASE NOTE: Students are responsible for finding out the date and time of the final exam once the schedule is posted by the Examination Office. Any conflicts or problems with the scheduling of the final exam must be reported directly to the Examination Office, **not** to your instructor. It is the Department's policy and the Examination Office's policy **that students are to be available until the end of the final exam period. Conflicts due to travel plans will not be accommodated.**

Calculators: The only calculators allowed in tests or at the final exam are those allowed at SOA/CAS exams.

The list of calculators approved by the Society of Actuaries is here:
https://www.soa.org/education/exam-req/exam-day-info/edu-calculators.aspx

Student Services
You may wish to access the many services available to you as a Concordia student. An overview of these resources can be found here: https://www.concordia.ca/students/services.html

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: https://www.concordia.ca/conduct/academic-integrity.html" *[Undergraduate Calendar, Sec 17.10.2]*

Behaviour
All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the Code of Rights and Responsibilities which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in University activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Intellectual Property
Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the Academic Code of Conduct and/or the Code of Rights and Responsibilities. As specified in the Policy on Intellectual Property, the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Extraordinary circumstances
In the event of extraordinary circumstances and pursuant to the Academic Regulations the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the change.