MATH 3640 – Short-Term Insurance Ratemaking ~ *Fall 2026*

Three credits *6:00 PM to 7:15 PM ~ Tuesdays and Thursdays ~ MONT 111*

Instructor

Kristina Machaj, FSA Email: kristina.machaj@uconn.edu

This syllabus is subject to change. Any changes made to the syllabus will be published on HuskyCT.

My office hours *(MONT 129)***:**

- In-person: Tuesdays and Thursdays immediately after class – *please feel free to stay after class with any questions!*
- As needed through email

Note: If at any point throughout the semester you are interested in learning more about real world actuarial work or what being a health actuary is like, let me know! I'm happy to chat through my career journey and experiences as you begin your own careers.

Course Objectives

The objective of this class is to provide you with a fundamental understanding of short-term insurance ratemaking concepts and techniques. These techniques are used by insurance companies and non-insurance entities that retain risk. This course's content covers several topics from SOA Exams FAM & ASTAM and CAS Exam 5.

We will successfully accomplish these objectives only if we work together. My role will be to provide a forum for the review and discussion of these topics and ultimately to test your understanding of the materials. In turn, you will be expected to prepare for each class and to participate actively in classroom discussions. **My goal is for you to leave this class with a stronger understanding of both the mathematical and business concepts that actuaries work with day to day.**

Course Materials

Suggested materials for this class are aligned to those outlined in the syllabi of SOA Exams FAM and ASTAM, and CAS Exam 5. Those widely accessible are posted in HuskyCT (no purchase necessary).

- Werner, G, and Modlin, C., Basic Ratemaking, Casualty Actuarial Society, Fifth Edition, May 2016.
- Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance (Fifth Edition), 2022 by Brown and Lennox, ACTEX.
- Statement of Principles Regarding Property and Casualty Insurance Ratemaking, Casualty Actuarial Society, May 1988.
- Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 13, Trending Procedures in Property/Casualty Insurance," revised in 2009, updated for deviation language in 2011.

- Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 12, Risk Classification (for all Practice Areas)," revised in 2005, updated for deviation language in 2011.

Grading for the Course

Your grade for this class will be based on the following weightings:

10%	Homework Assignments *(5)**
35%	Exam 1**
35%	Exam 2**
20%	Actuarial Project *(19% project / 1% evaluation)*
35%	Comprehensive Final Exam**

A	**93.0 - 100**
A-	**90.0 - 92.9**
B+	**87.0 - 89.9**
B	**83.0 - 86.9**
B-	**80.0 - 82.9**
C+	**77.0 - 79.9**
C	**73.0 - 76.9**
C-	**70.0 - 72.9**
D+	**67.0 - 69.9**
D	**63.0 - 66.9**
D-	**60.0 - 62.9**
F	**< 60**

I will not round grades all semester long and then your final grade will be rounded to the tenth and your letter grade will be given according to the table above.

** Please note that the Homework Assignments are for the purpose of helping you study, solidifying concepts from class. As such,* ***I will not be fully grading them****. Rather, I will be giving you a grade based off how much of the assignment you complete. The act of just completing the assignment and not taking it seriously will only hurt yourself. Upon release of the answers, you can self-grade and we will discuss any follow-up questions. Assignments should be turned in by Sunday night at 11:59PM during the week indicated on the class schedule, unless otherwise specified. Assignments may be accepted late, but only until the start of that week's Tuesday class (6:00 PM) and will be marked down by 25%.*

*** Please note that I will drop the lowest of your exam grades for the overall course total. For example, if you did well on Exam 1, bombed Exam 2, and did medium on the Final, I will use Exam 1 and the Final for the total calculation. Another example, if you did fantastic on both Exams 1 & 2, there may be no need for you to sit for the final (i.e. take a zero, knowing it will be dropped in the total calc).*

Computers, Programs and Calculators

You are required to bring an SOA approved calculator to each class as we will frequently work through mathematical problems in class.

You may choose to complete homework in Microsoft Word/Excel if you wish, although this is not required. You may also choose to submit paper/pencil answers with **clear** and **legible** work, uploaded to HuskyCT as a pdf (using apps such as Cam Scanner, Tiny Scanner, etc.).

You are permitted to take notes on a tablet/laptop during class if you desire. Please refrain from the use of email, instant messaging, or any other distracting behavior during class. The use of cell phones is not permitted in this class except in the case of an emergency. Minimizing distractions will be beneficial to everyone as this class moves quickly!

Appeal Process

If you feel that an answer you provided deserved more points than it was awarded, simply send an e-mail within two class days of when the grades were released. Your appeal must include the following:

1. Note which item(s) you are concerned with and what you answered.
2. Justify why your answer warrants more points, using reference materials from the class, information from other classes, or other reliable sources.
3. Tell me how many points you think your answer deserves; what you think is fair.

Note: This process is similar to the process used for appeals on SOA and CAS examinations. Successful appeals typically have the following characteristics:

- Cite references in the Syllabus for an alternative answer.
- Explain fully an alternative answer including alternative solution for a numerical question.
- Point out an error in the answer key for the short-answer questions and the reasoning for an alternative correct answer.

I will consider each appeal that is sent and let you know what I think is fair. We can talk in person if you are not satisfied with the outcome.

Actuarial Project

One of the more significant responsibilities for actuaries is the rate indications process as well as the calculation of proposed rate factors via classification ratemaking. The rate indications process assists management in its determination of the premium to charge future policyholders and classification ratemaking assists management in deciding the factors to be applied in order to properly segment the book of business when calculating premium, so as to avoid adverse selection.

The Actuarial Project will have you evaluate methodologies, including on-leveling, trending, benchmarking, and others used to come up with these estimates and answer questions using your knowledge gained during the course. This will be a take-home evaluation done in collaboration with predetermined groups. Your groups will also be expected to present to the class on your findings.

Code of Conduct

All of you aspire to become actuaries. As actuaries - and even as candidates - you agree to live by a Code of Professional Conduct. This code governs your work as actuaries, but also outlines your responsibilities to the profession and to the public.

Precept 1 of the Code is entitled Professional Integrity. It states: "An actuary shall act honestly, with integrity and competence, and in a manner to fulfill the profession's responsibility to the public and to uphold the reputation of the actuarial profession."

Precept 13 of the Code is entitled Violations of the Code of Professional Conduct. It states: "An Actuary with knowledge of an apparent, unresolved, material violation of the Code by another Actuary should consider discussing the situation with the other Actuary and attempt to resolve the apparent violation. If such discussion is not attempted or is unsuccessful, the Actuary shall disclose such violation to the appropriate counseling and discipline body of the profession….".

The Code of Professional Conduct encompasses my expectations for how you will behave in this class. I will expect that each of you act honestly - and with integrity – in all facets of this class (including but not limited to exams and assignments). As Precept 13 relates to this class, any student who suspects or observes cheating by another student (an apparent violation of the Code) is expected to disclose such apparent violation.

I am trusting you. If you cheat, your ethics will be compromised, and you will not have gained the proper level of understanding to prepare you for your actuarial exam.

Cheating on a midterm or final will result in a zero for the respective exam. If cheating persists, disciplinary actions will incur and you will fail the course. I hope to see you all succeed and will provide you the tools you need to do so.

Use of AI software

AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to become a successful actuary. At the same time, you should learn how to use AI and in what instances AI can be helpful to you. If you use it, cite it in your work (e.g. "ChatGPT, personal communication, MM/DD/YYYY"), to stay within university policies on academic honesty. You are responsible for making sure that any content is accurate and says what you want it to say. No more than 25% of student work in this course should be generated by AI.

Please remember: Don't accept anything it generates at face value without checking it critically. AI may provide completely erroneous responses; every response should be carefully vetted for accuracy and validity.

The use of generative AI tools (e.g., ChatGPT, Google Bard, Microsoft Copilot, Claude, etc.) is permitted in this course for the following activities:

- Brainstorming and refining your ideas.
- Studying further on particular topics, after referencing class notes, slides, and the text.
- Finding information on a particular topic.
- Drafting an outline to organize your thoughts.
- Checking grammar and style.

An example of how you might use AI to your advantage: If you organize your class notes, homework, and lecture slides into neat folder systems, you can leverage AI to help create a midterm/final exam study guide. But be warned that AI may misinterpret specific applications, so be sure to check its work and use it as support only, NOT replacement for critical thinking and understanding.

The use of generative AI tools is NOT permitted in this course for the following activities:

- Impersonating you in classroom contexts, such as by using the tool to compose responses to assignments, exams, and/or the group project.
- Writing sentences, paragraphs, etc. to complete assignments greater than 25% of the total content.

You are responsible for the information you submit based on an AI query (i.e. that it does not violate intellectual property laws, or contains misinformation or unethical content).