SYRACUSE UNIVERSITY
MAT 500, ACTUARIAL MATHEMATICS
SPRING 2016 SYLLABUS

SECTION: M001 (Class No: 48204)
Class: Mon & Wed 8:00AM - 9:20AM in Carnegie 120
Instructor: Thomas John, Ph.D.
Contact Information: Office: Carnegie 313A, Phone: 443-1587, email: thjohn@syr.edu
Office Hours: Mon & Wed 10:00AM - 11:00AM or by appointment.

Catalogue Description: Applied probability with focus on actuarial models. Common distributions used in actuarial applications. Conditional expectation. Moment generating functions. Probability inequalities. Limit theorems. Introduction to financial mathematics. Basics of interest theory. Basics of annuity theory. Basics of financial derivatives.

Course Overview: The goal of the course is to provide partial preparation towards actuarial exams 1/P and 2/FM. The first half of the semester will focus on applications of probability models in risk/insurance areas. This entails covering some topics that may not have been covered in MAT 521 and extending the topics covered in MAT 521 to specific applications. The second half of the semester will focus on introductory mathematical theory of insurance, annuities, and financial derivatives.

Notes About Actuarial Exam Preparation: While exam 1/P is based mostly on MAT 521 topics, the actuarial exam questions expect a much deeper understanding of the material and the ability to manipulate the relationships between different quantities of interest at a quick pace. Similarly, exam 2/FM is based on introductory mathematical theory of insurance and financial instruments. But the exam questions expect a solid familiarity with those introductory topics and terminology.

In the introduction to ASM study manual for Exam P, the author introduces the following rule:

> *Fundamental Rule for Passing Actuarial Examinations*
>   You should greet every problem you see when you are taking the exam with these words: "Been there, done that."
>
>   . . .
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>   There is simply not enough time to think on the exam. *Thinking is always the last resort on an actuarial exam.* You may not have seen this very problem before, but you must have seen a problem like it before. If you have not, you are not prepared.

As such, it will require the student to put in dedication through this course and extensive preparation past this course on their own to successfully pass these examinations. This course is only meant to facilitate a good familiarity with the general classes of problems that appear in these exams. It is unrealistic in a semester course to work through every particular type of problem that could show up. It is the student's responsibility to complement this course with individual practice/preparation after this course preparing for the exams.

Text: Following textbooks will be used as references.
Probability and Statistics, 4th Ed, by DeGroot and Schervish, ISBN-13: 9780321500465. This is the MAT 521 textbook.

Mathematical interest theory, by Vaaler, LJF; Daniel, JW, ISBN-13: 9780883857540. This textbook is available as an eBook through Syracuse University library.

The study guides available online from http://faculty.atu.edu/mfinan/actuaries.html will be used as additional resources.

Mathematics Prerequisite: Prerequisite: MAT 521 or permission of instructor.

Grading: Grades for the course will be based on the total number of points accumulated on daily quizzes and two tests. The two tests will count 30% each (for a total of 60%), quizzes 30%, and class participation/preparation 10% toward your grade. There will be absolutely no make-ups for any reason. If you miss a quiz/test for a valid reason (which <u>must</u> be verified by a note from a physician or your dean's office), performance from the corresponding part of a test/final will be used as replacement.

Exams: The dates for the exams are:

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Test 1: Wednesday, March 2

Test 2: Wednesday, April 27

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Homework: Homework will be assigned regularly and some of the problems will be asked to be turned in. You may discuss these problems with other students, but each of you is expected to write up your own solutions independently. The <u>best</u> way to learn this material is to do homework problems. Try as much as possible to do the homework on your own.

Quiz: There will be a quiz **every lecture**. These quizzes will be one or two problems very similar to the homework problems. The specifics will be announced in lecture ahead of time.

Attendance: You are expected to attend every class and every exam. If you miss a class, it is your responsibility to obtain a copy of the lecture notes for that class from another student. You are also responsible for any announcements about changes to the course schedule, the exam schedule, or the course requirements that were made during that class.

Cell Phones: Cell phones should be turned off and put away during class. **This policy will be strictly enforced in class. Repeated violations of this policy will be recorded and overall course grade will be affected by such behavior.** Particularly, calculators on cell phones cannot be used on quizzes/tests.

Spring 2016 - Academic Calendar Dates:
- Financial deadline to drop class: Tuesday, February 9, 2016
- Academic drop deadline: Tuesday, March 22, 2016
- Withdrawal deadline: Tuesday, April 19, 2016

Students with Disabilities: If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), http://disabilityservices.syr.edu, located in Room 303 of 804 University Avenue, or call 315-443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. You are also

welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations.

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see http://academicintegrity.syr.edu

Religious observances policy: SU religious observances policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to are religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice (Student Services > Enrollment > My Religious Observances) from the first day of class until the end of the second week of class.