

**SYRACUSE UNIVERSITY  
MAT 500, ACTUARIAL MATHEMATICS  
SPRING 2017 SYLLABUS**

**Class:** Tue & Thu 11:00AM - 12:20AM in Carnegie 120

**Instructor:** Thomas John, Ph.D.

**Contact Information:** Office: Carnegie 313A, Phone: 443-1587, email: thjohn@syr.edu

**Office Hours:** TBA

**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.

**Text:** Following textbooks will be used as references.

*Probability and Statistics*, 4th Edition, by DeGroot and Schervish, ISBN-13: 9780321500465.

*Mathematical interest theory*, by Vaaler and Daniel, 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.

**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 25% each (for a total of 50%), quizzes 35%, and **class participation/preparation 15%** toward your grade. There will be absolutely no make-ups for any reason. If you miss a quiz/test for a valid reason (which must 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:

Test 1: Thursday, March 2

Test 2: Thursday, April 27

**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 best 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 2017 - Academic Calendar Dates:**

- Financial deadline to drop class: Tuesday, February 7, 2017
- Academic drop deadline: Tuesday, March 21, 2017
- Withdrawal deadline: Tuesday, April 18, 2017

**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:** Syracuse University sets high standards for academic integrity. Those standards are supported and enforced by students, including those who serve as academic integrity hearing panel members and hearing officers. The presumptive sanction for a first offense is course failure, accompanied by the transcript notation “Violation of the Academic Integrity Policy”. Students should review the Office of Academic Integrity online resource “Twenty Questions and Answers About the Syracuse University Academic Integrity Policy” and confer with instructors about course-specific citation methods, permitted collaboration (if any), and rules for examinations. The Policy also governs the veracity of signatures on attendance sheets and other verification of participation in class activities. For more information and the complete policy, see <http://academicintegrity.syr.edu>.

For this course in particular, the use of any notes or the use of any devices capable of wireless communication during quizzes and exams (until quiz/exam is handed in to the instructor) is considered to be a violation of the academic integrity policy.
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All violations will be reported to the Academic Integrity Office (AIO).

**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.

**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.”

...

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.