

MATH 472 / 567:
ACTUARIAL THEORY II / TOPICS IN ACTUARIAL THEORY I
SPRING 2009

INSTRUCTOR: Name: Paul H. Johnson, Jr.
Office: 361 Altgeld Hall
Office phone number: 244-5517
E-mail address: pjohnson@illinois.edu
Office Hours: M 3:00 – 5:00pm, Tu 2:00 – 4:00pm, and by appointment

Please include “MATH 472” or “MATH 567” in the subject line of any e-mail pertaining to the class. Also, I will not respond to phone calls or e-mails between 9:00pm and 9:00am.

COURSE DESCRIPTION: This course considers extensions and applications of the material covered in MATH 471: Actuarial Theory I. We will cover the second half of the *Actuarial Mathematics* text material on Exam MLC, the Life Contingencies Segment of Exam M, of the Society of Actuaries:

Chapter 8: Analysis of Benefit Reserves (sections 8.1 - 8.5)

Chapter 9: Multiple Life Functions (sections 9.1 - 9.5, 9.6.1, 9.7, 9.9)

Chapter 10: Multiple Decrement Models (sections 10.1 – 10.4, 10.5 – 10.5.1, 10.5.4, 10.6)

Chapter 11: Applications of Multiple Decrement Theory (sections 11.1-11.3)

Chapter 15: Insurance Models with Expenses (sections 15.1-15.2.1, 15.4, 15.6-15.6.1)

*Stochastic Processes (Markov Chain Models and Poisson Processes)

*These topics will be covered time permitting. However, it should be assumed that we will not get to these two additional topics, and that you should individually read the stochastic processes online study notes (on the course website) and work problems from past exams for these topics.

LECTURES: Sections D13, D14: MWF 11:00 - 11:50am, 114 David Kinley Hall
Section E13: MWF 1:00 – 1:50pm, 328 Armory

PREREQUISITE: MATH 471: Actuarial Theory I. Working knowledge of the material in MATH 471 will be assumed in this course.

REQUIRED TEXT: Bowers et al., *Actuarial Mathematics, Second Edition*, Society of Actuaries, 1997

COURSE WEBSITE: On Illinois Compass.
All announcements, handouts, homework assignments and solutions, in-class assignments and solutions, midterm and final exam solutions, useful links, and more will be found here. Make sure you check this website regularly.

CALCULATORS: The only calculators allowed for this class are those permitted for use on Exam MLC; refer to the approved calculators list on the Society of Actuaries' website, <http://www.soa.org/education/exam-req/exam-day-info/edu-calculators.aspx>.

ATTENDANCE: I encourage you to attend class and to arrive on time. Some of the material covered and many of the examples discussed will only be presented during lecture. Furthermore, in-class assignments can only be completed during lecture.

1. GRADING:

MIDTERMS: There will be two midterms:

Midterm 1: Monday, February 16, room TBD, 7:00-8:40pm

Midterm 2: Monday, April 6, room TBD, 7:00-8:40pm

Note that midterms are not administered during the lecture sections; students in all sections will take each midterm together during the above evening times. Midterms are not cumulative *per se*, but the nature of the material in this course is such that knowledge of concepts from MATH 471 is required to learn and apply concepts in MATH 472. I will announce the material to be covered on each midterm at least one week before the exam date. Both midterms are closed book, no notes.

To account for the fact that midterms are scheduled outside of class, there will be no lecture sections held on the following days:

Monday, February 16; Wednesday, February 18; Monday, April 6; Wednesday, April 8.

MISSED MIDTERM POLICY: If students cannot take either midterm at its scheduled time, they can take a make-up midterm if they have BOTH a valid excuse and appropriate documentation; documentation must be presented prior to taking the make-up midterm, otherwise, a student may not be allowed to write the midterm. Students with conflicts should let me know as soon as possible and no later than the Friday before the exam to be missed (February 13 for Midterm 1 and April 3 for Midterm 2).

Make-up midterms will be administered during the missed lecture sections in two parts (only half of the questions on the entire midterm will be administered during Part 1, the other half will be worked during Part 2):

Make-up Midterm 1 Part 1: Monday, February 16

Make-up Midterm 1 Part 2: Wednesday, February 18

Make-up Midterm 2 Part 1: Monday, April 6

Make-up Midterm 2 Part 2: Wednesday, April 8

Students in sections D13 and D14 will take a make-up midterm on Monday and Wednesday from 11:00 - 11:50am in 114 David Kinley Hall on the appropriate above days; students in section E13 will take the make-up midterm from 1:00 – 1:50pm in 328 Armory on the above days. These dates and times are the ONLY ones available for a make-up midterm. You must attend BOTH parts of a make-up midterm in order to receive any credit for the exam.

If students cannot attend either the scheduled or make-up midterm, then the remaining midterm and final exam will be re-weighted to compensate for a missed midterm (provided both a valid excuse and documentation are provided). This policy will also be applied to students who miss the scheduled midterm and provide a valid excuse and documentation after the fact. Otherwise, a missed midterm results in a grade of zero for that exam (except, possibly in extremis).

FINAL EXAM: Students in all lecture sections will take the final exam together. Since the final is a combined exam, you cannot rely on the final exam schedule which is only for non-combined finals. I will alert the class as to the day and time of the final exam as soon as it is scheduled. The final exam will be cumulative. You are allowed one “cheat sheet” for the final: both sides of one sheet of standard printer-sized paper (the size of the sheet this syllabus is printed on). If students have a university-approved reason why they cannot take the final exam at its scheduled time (if the time scheduled conflicts with a final for another class, violates the “3 finals in 24 hours” rule, or other valid reason), they will be allowed to take the final on an alternate day TBD. Students should follow the guidelines in the Student Code to request a conflict exam.

2. **HOMEWORK:** Homework will be assigned each Wednesday and will be due at the START OF CLASS on the following Wednesday. There will be NO make-up homework assignments. Late homework will not be accepted, nor will homework dropped off in my mailbox (unless previously approved by me). I want to emphasize: homework that is turned in after I ask for it in lecture will NOT be accepted (if there is a systematic reason why you cannot turn in your homework on time, I will work to accommodate you). The lowest two homework scores will be dropped and the remaining scores will determine your overall homework grade.

For each homework assignment, only some of the problems will actually be graded – of course, you will not know which problems these are in advance. Homework should be written on sheets of loose-leaf paper and should be neat and organized; points may be taken off if these criteria are not met. It is also preferred that each homework is bound when necessary. I will post solutions to all of the homework problems on the course website shortly after collecting the homework from both lecture sections. There will be no homework due during the week of a midterm.

3. **IN-CLASS ASSIGNMENTS:** 10 in-class assignments will be given in random lectures throughout the semester. Students will work on one problem in groups for about 25-30 minutes, and each student will turn in their work during that same lecture. The problem will be based on material from a previous lecture; students will have already worked homework problems based on the material on any in-class assignment. During an in-class assignment, students may refer to their group-mates, the text, their notes, or past homework assignments/solutions. There are NO make-up in-class assignments. Furthermore, students registered in either lecture sections D13 or D14 who miss an in-class assignment during their lecture will NOT be allowed to work the in-class assignment during lecture section E13. I will post solutions to each in-class assignment on the course website. There will be no in-class assignments during the week of a midterm.

4. **FOR JAMES SCHOLAR STUDENTS ONLY:** Pre-approved James Scholar students who are taking this course for honors credit will be required to complete one additional project, due by the last day of class, Wednesday, May 6. Refer to the course website for more detailed information about this project. Successful performance on this project will result in honors credit.

5. **FOR GRADUATE STUDENTS ONLY:** Graduate students taking this class for four credit hours will be required to complete one additional project, due by the last day of class, Wednesday, May 6. Refer to the course website for more detailed information about this project. Performance on this project may impact the final grade (either positively or negatively); not doing the project at all will most definitely negatively impact the final grade!

GRADING DISTRIBUTION:

| | | |
|-----------------------------|-----------------------------|--------------|
| 2 Midterms | (80 points / 20% each) | = 40% |
| Final Exam | (120 points) | = 30% |
| Homework | (8 points / 2% each) | = 20% |
| <u>In-Class Assignments</u> | <u>(4 points / 1% each)</u> | <u>= 10%</u> |
| Total Points = 400 (100%) | | |

GRADING SCALE: The following scale gives the lowest grade you can earn:

| | | | |
|-----------|----|----------|----|
| 93 – 100% | A | 72 – 78% | C |
| 90 – 93% | A- | 70 – 72% | C- |
| 88 – 90% | B+ | 68 – 70% | D+ |
| 82 – 88% | B | 62 – 68% | D |
| 80 – 82% | B- | 60 – 62% | D- |
| 78 – 80% | C+ | 0 – 60% | F |

IMPORTANT EXAM MLC DATES:

Registration Deadline: Wednesday, March 25, 2009 – student fee is \$240.

Refund/Cancellation: Thursday, April 30, 2009.

Exam Date: Friday, May 15, 2009 from 8:30-11:30am.

For detailed information, visit the Exam M homepage: <http://www.soa.org/education/exam-req/edu-exam-m-detail.aspx>. I recommend you look at this as soon as possible.

For information pertaining to other actuarial exams: <http://www.soa.org/education/exam-req/edu-asa-req.aspx>.