MATH 471: ACTUARIAL THEORY I
FALL 2012

INSTRUCTOR:
Name: Paul H. Johnson, Jr.
Office: 361 Altgeld Hall
Office phone number: (217)-244-5517
E-mail address: pjohnson@illinois.edu
Website: http://www.math.uiuc.edu/~pjohnson/
Office Hours: Monday 1:00-2:00pm, Tuesday 2:00 – 5:00pm, and by appointment

Please include “MATH 471” in the subject line of any e-mail pertaining to the class.

LECTURES: Section D1: MW 11:00am - 12:20pm, 106B8 Engineering Hall
Section G1: MW 3:00pm – 4:20pm, 1002 Lincoln Hall

PREREQUISITES: MATH/STAT 408 (Actuarial Statistics I) and MATH 210 (Theory of Interest). Note: Working knowledge of this material will be assumed.

COURSE WEBSITE: On Illinois Compass 2g: https://compass2g.illinois.edu/webapps/login/. All announcements, handouts, homework assignments and solutions, midterm solutions, useful links, and more will be found here. Make sure you check this website regularly.

REQUIRED TEXTS: (1) Dickson, Hardy, and Waters (2009), Actuarial Mathematics for Life Contingent Risks, Cambridge: Cambridge University Press

(2) Johnson, Paul H. Jr. (2012), SOA Exam MLC and CAS Exam 3L Study Supplement, Midwestern Actuarial Forum’s Exam Preparation Seminars (available for free on Course Website)
COURSE DESCRIPTION: This course will analyze the distribution of the time-until-death random variable for a single life, and its implications for the evaluation of insurances, annuities, and premiums. We will cover approximately the first half of the material on Exam MLC, the Life Contingencies Segment of Exam M, of the Society of Actuaries.

**Actuarial Mathematics for Life Contingent Risks**

Chapter 1: Introduction to Life Insurance  
Chapter 2: Survival Models  
Chapter 3: Life Tables and Selection + Text Supplement (Section 1)  
Chapter 4: Insurance Benefits  
Chapter 5: Annuities  
Chapter 6: Premium Calculation

**SOA Exam MLC and CAS Exam 3L Study Supplement**

Section 1: Survival Models and Life Tables  
Section 2: Selection  
Section 3: Insurance Benefits I  
Section 4: Insurance Benefits II  
Section 5: Annuities I  
Section 6: Annuities II  
Section 7: Premium Calculation I  
Section 8: Premium Calculation II

**CALCULATORS:** Only non-graphing scientific and/or financial calculators are allowed.

**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.

**CHEATING:** Any attempt to cheat in this course is considered a serious violation of University policy. I will investigate any instance of cheating, and anyone who participated in cheating will receive a score of 0 on the assignment, exam, or project.

**IMPORTANT EXAM MLC INFO:** [http://www.soa.org/education/exam-req/edu-exam-m-detail.aspx](http://www.soa.org/education/exam-req/edu-exam-m-detail.aspx)

Registration Deadline: **Monday, September 24, 2012** – student fee is $240.  
Exam Date: **Tuesday, November 6, 2012** from 8:30-11:30am.
GRADING:

1. MIDTERMS: There will be two midterms:

   Midterm 1: Monday, October 1, room TBD, 7:00-8:30pm
   Midterm 2: Monday, November 12, room TBD, 7:00-8:30pm

   Midterms are not cumulative per se, but the nature of the material is such that knowledge of concepts from earlier chapters/sections is required to learn and apply concepts in later chapters/sections. I will announce the material to be covered on each midterm one week before the exam date. Both midterms are closed book, no notes. However, you are allowed both sides of one 3in x 5in note card for each midterm.

   Students in all sections will take each midterm during the above evening times. There will be no lecture sections held on the day of a midterm.

   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 (refer to the UIUC Student Code). 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. Students who inform me of a conflict after the scheduled midterm has occurred may take a more difficult make-up midterm.

2. FINAL EXAM: The final exam is scheduled for:

   Friday, December 14, room TBD, 8:00-11:00am

   Students in all lecture sections will take the final exam together. 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 a student has a university-approved reason why they cannot take the final exam at its scheduled time (refer to the UIUC Student Code), they will be allowed to take a conflict final exam.

3. HOMEWORK: Homework will be assigned and collected on most Wednesdays. Late homework will not be accepted, nor will homework dropped off in my mailbox (unless previously approved by me). There will be a total of 11 homework assignments. The lowest homework score 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. I will post solutions to all of the homework problems on the course website shortly after collecting the homework. There will be no homework due during the week of a midterm.

4. CLASS PROJECT: Students will work together in groups to complete a project, using Microsoft Excel, that summarizes and applies the material covered in this course.

   The class project will be due on Monday, December 10, at the START OF CLASS.
GRADING DISTRIBUTION:

Midterms (40 points each / 20% each) = 40%
Final Exam (50 points) = 25%
Homework (5 points each / 2% each) = 25%
Class Project (20 points) = 10%
Total Points = 200 (100%)

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

- [98, 100]: A+
- [92, 98): A
- [90, 92): A-
- [88, 90): B+
- [82, 88): B
- [80, 82): B-
- [78, 80): C+
- [72, 78): C
- [70, 72): C-
- [68, 70): D+
- [62, 68): D
- [60, 62): D-
- [0, 60): F

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. Refer to the course website over the next two weeks for more detailed information about this project.

The James Scholar project will be due on Monday, December 10, at the START OF CLASS.