INSR 253/STAT 453
INSR 833/STAT 853
ACTUARIAL STATISTICS
Academic Year 2011-2012

Textbooks:

Klugman, Panjer, Willmot: "Loss Models: From Data to Decisions". John Wiley, second
     edition, 2004, or third edition, 2008 (bookstore)
Study note from the Society of Actuaries: Daniel: "Poisson processes (and mixture
     distributions)" (in course pack)
Study note from the Society of Actuaries: Daniel: "Multi-State Transition Models with
     Actuarial Applications" (in course pack)
Course pack: www.study.net.

Office hours:

Tuesdays and Thursdays, 12:30-1:30, Tuesdays 4:30-5:30, and by appointment, SH-DH
3404 (lemaire@wharton.upenn.edu)

Note: If you hit "**Reply**" on an e-mail from me to the class, you are replying to the
whole class.

Syllabus

Poisson Models (Soa Study note)

Lesson 1 (9/8):   The Poisson process
Lesson 2 (9/13):   The distribution of waiting times
Lesson 3 (9/15):   Thinning. Non-homogeneous Poisson processes
Lesson 4 (9/20):   The Compound Poisson process I
Lesson 5 (9/22):   The Compound Poisson process II
Lesson 6 (9/27):   Mixed Poisson processes
Lesson 7 (9/29):   Conditional distributions

Aggregate Loss Models (Klugman, 2nd edition chapter 6 or 3rd edition chapter 9)

Lesson 8 (10/4):   The Compound model
Lesson 9 (10/6):   Convolution of two random variables
Lesson 10 (10/13): The moments of aggregate losses
Lesson 11 (10/18): Normal approximations
Lesson 12 (10/20): Normal approximations
Lesson 13 (10/25): Net stop loss premiums
Lesson 14 (10/27): Examples

<u>Markov Chains</u> (SoA Study Note)

Lesson 15 (11/1): Definition of a Markov Chain
Lesson 16 (11/3): **Mid-term on Poisson Models and Aggregate Loss Models**
                   You must have in class a calculator (SoA or equivalent). You may
                   also a a few hand-written pages with formulas. The mid-term exam
                   counts for 50% of grade
Lesson 17 (11/8): Chapman – Kolmogorov equations
Lesson 18 (11/10): The stationary distribution
Lesson 19 (11/15): Examples: Gambler's ruin and credit scoring
Lesson 20 (11/17): Application to genetics
Lesson 21 (11/22): Example: Bonus-Malus systems in automobile insurance
Lesson 22 (11/29): Present value of cash flows in Markov Chains
Lesson 23 (12/1): Present value of cash flows in Markov Chains
Lesson 24 (12/6): Example: Continuing care retirement community
Lesson 25 (12/8): Continuous Markov Chains. Application to Genetics

Final exam (50% of grade): Tentatively Friday 12/16, 12:00. Same rules as mid-term.
        The final exam is on Markov Chains only.

All students enrolled in courses in the Business and Public Policy Department (including
Insurance and Risk courses) is expected to comply with the University of Pennsylvania's
Code of Academic Integrity. We encourage all students to read the University's Code so
that they are well aware of all situations that would be considered a violation thereof.

It is the policy of the Department of Business and Public Policy to immediately fail any
student who is to be in violation of the University of Pennsylvania's Code of Academic
Integrity. Cheating, in any manner, on a graded assignment or exam will result in failing
both the assignment/exam and the course. In addition to the sanctions imposed by the
Department of Business and Public Policy, the Office of Student Conduct may impose
additional sanctions.

Please review the Code of Academic Integrity on the below link as well as example of
violations and possible sanctions:

http://www.upenn.edu/provost/PennBook/academic_integrity_code_of