STAT 453/BEPP 453/STAT 853/BEPP 853
ACTUARIAL STATISTICS
Fall 2015

Reading material:

Poisson Models:
Either Study note from the Society of Actuaries: Daniel "Poisson Processes and mixture distributions" (in course pack)
Or   S. Ross: "Introduction to Probability Models". 6th or later edition, Academic Press

Aggregate Loss Models:
Klugman, Panjer, Willmot: "Loss Models: From Data to Decisions". Second, third, or fourth edition, John Wiley (bookstore or Lippincott reserve)

Markov Chains:
Study note from the Society of Actuaries: Daniel: "Multi-State Transition Models with Actuarial Applications" (in course pack)

Course pack: www.study.net. Password: INSR2010

Office hours: Tuesdays and Thursdays, 4:30-6:00, and by appointment, JMHH 458 (lemaire@wharton.upenn.edu)

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

Syllabus

Poisson Models

Lesson 1 (8/27):   The Poisson process
Lesson 2 (9/1):   The distribution of waiting times
Lesson 3 (9/3):   Thinning. Non-homogeneous Poisson processes
Lesson 4 (9/8):   The Compound Poisson process I
Lesson 5 (9/10):   The Compound Poisson process II
Lesson 6 (9/15):   Mixed Poisson processes
Lesson 7 (9/17):   Mixed Poisson processes
Lesson 8 (9/22):   Applications
Lesson 9 (9/24):   Applications

Aggregate Loss Models

Lesson 10 (9/29)   The compound model
Lesson 11 (10/1):   Convolution of two random variables
Lesson 12 (10/6):   The moments of aggregate losses

Lesson 13 (10/13):	Normal approximations I
Lesson 14 (10/15):	Normal approximations II
Lesson 15 (10/20):	Net stop loss premiums
Lesson 16 (10/22):	Examples

<u>Markov Chains</u>

Lesson 17 (10/27):	Definition of a Markov Chain
Lesson 18 (10/29):	Chapman – Kolmogorov equations
Lesson 19 (11/3):	**Mid-term on Poisson Models and Aggregate Loss Models**

Open book, with SoA calculator. You may have in class: Textbooks, your class notes, a few pages with formulas. You may not have in class: ACTEX manuals or any other material. Exam counts for 50% of grade

Lesson 20 (11/5):	The stationary distribution
Lesson 21 (11/10):	Examples: Gambler's ruin and credit scoring
Lesson 22 (11/12):	Application to genetics
Lesson 23 (11/17):	Example: Bonus-Malus systems in automobile insurance
Lesson 24 (11/19):	Present value of cash flows in Markov Chains
Lesson 25 (11/24):	Examples: Continuing care retirement community and Chinese Bonus-Malus System
Lesson 26 (12/1):	Continuous Markov Chains.
Lesson 27 (12/3):	Continuous Markov Chains
Lesson 28 (12/8):	Application to Genetics

Final exam on Markov Chains (50% of grade): Same rules as mid-term.

Solutions to most course pack questions: www.soa.org. Click on Education, Exams and Requirements, ASA, Exam MLC or C, Past Exam Questions and Solutions. Find exam session and click Solutions.