Reading material:


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](http://www.study.net). Password: INSR2010

Office hours: Tuesdays and Thursday, 3:00-4:45, 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

1. The Poisson Process

   Lesson 1 (8/28): The Poisson process
   Lesson 2 (8/30): The distribution of waiting times


   Lesson 3 (9/4): The collective risk model. The Compound model
   Lesson 4 (9/6): Convolutions. The Compound Poisson model
   Lesson 5 (9/11): Calculation of moments
   Lesson 6 (9/13): Normal approximations
   Lesson 7 (9/18): Conditional expectations
   Lesson 8 (9/20): Special cases

3. Coverage modifications

   Lesson 9 (9/25): Regular deductibles
   Lesson 10 (9/27): Stop loss premiums
   Lesson 11 (10/2): Stop loss premiums II
   Lesson 12 (10/9): Policy limits
Lesson 13 (10/11): The loss elimination ratio
Lesson 14 (10/16): Inflation
Lesson 15 (10/18): Applications

4. The mixed Poisson process

Lesson 16 (10/23): Mixed distributions
Lesson 17 (10/25): Applications of Bayes theorem

Lesson 18 (10/30): **Mid-term on first three parts** (50% of grade)
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

5. Markov Chains

Lesson 19 (11/1): Definition of a Markov Chain
Lesson 20 (11/6): Chapman – Kolmogorov equations
Lesson 21 (11/8): The stationary distribution
Lesson 22 (11/11): Examples: Gambler’s ruin and credit scoring
Lesson 23 (11/15): Application to genetics
Lesson 24 (11/20): Example: Bonus-Malus systems in automobile insurance
Lesson 25 (11/27): Present value of cash flows in Markov Chains
Lesson 27 (12/4): Continuous Markov Chains
Lesson 28 (12/6): Application to Genetics

**Final exam on parts 4 and 5** (50% of grade): Same rules as mid-term.

Solutions to most course pack questions: [www.soa.org](http://www.soa.org). Click on Education and Exams, Past Exam and Solutions.

You will need a calculator (TI BA II PLUS or equivalent) for the mid-term and the final. To be fair to all students, a calculator that multiplies matrices is not permitted for the final exam.