STAT 473: Actuarial Models, Spring 2007, Purdue University

- **General Information**
  - Instructor: Professor Frederi G. VIENS
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  - Office Hours: Th Th 9:40-10:25 am & 1:30-2:15 pm, in MATH 504
  - Class Hours: TTH 12:00-1:15 pm in REC 313

- **Catalog Course Description.** Continuation of STAT 472. Together, these courses cover contingent payment models, survival models, frequency and severity models, compound distribution models, simulation models, stochastic process models and ruin models. *This year, to reflect the changes in SOA exam M, we will also cover a number of financial economics topics.*

- **Homework.** Homework assignments will be due roughly every week-and-a-half, except weeks that have a midterm. Selected portions of the assignments will be graded. You are encouraged to discuss the assignments with other students but you must write up your homework independently; identical solutions are NOT acceptable. Your homework must reflect YOUR understanding of the material. See note below about plagiarism. Late homeworks will not be accepted. Your total homework grade will constitute at least 10% but no more than 20% of your total grade in the class.

- **Exams.** All exams will be closed-book, closed-notes, except possibly for a “crib” sheet.
  - Two Midterm Exams will be given during the regular class period, on dates to be assigned. These exams will cover all material seen in class up to and including a week before each exam. Each midterm exam will be worth at least 40% but no more than 50% of your total grade in the class. We anticipate that the material on financial economics (Black-Scholes theory) will be covered after the second midterm, and that there will be no in-class exam on this new material.
  - There will be No Final Exam in this course.

- **Outline of Course Topics**
  - **Multiple Decrement Models**
  - **Classifying and Creating Distributions**
    Chapter 4, sections 4.1-4.4, 4.6 (except 4.6.6, 4.6.8, 4.6.12)
  - **Frequency and Severity with coverage modifications**
    Chapter 5
  - **Aggregate Loss Models:**
    Chapter 6, sections 6.1-6.3, 6.7
  - **Rational valuation of derivative securities**
    (Black-Scholes option pricing, with delta hedging for risk management)
  - *(time permitting)* **Stochastic Interest Rates models** (Vasicek, CIR, Black-Derman-Toy)
  - *(time permitting)* **Stochastic processes:**
    The Poisson Process Ch. 8, section 8.1.1
    Brownian motion Ch. 8, sections 8.6, 8.7