University of Wisconsin – Madison
School of Business
Department of Actuarial Science, Risk Management and Insurance
Spring 2008
ACT SCI 653 – Loss Models II

Professor
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Email: mhalek@bus.wisc.edu
Office Hours: W 2p.m. – 5p.m. and by appointment

Class Hours: TR 9:30a.m. – 10:45 a.m.
Class Location: Grainger, Room 1185

Course Description
This course continues a study of the loss modeling processes introduced in Loss Models I. After a review of mathematical statistics, we will examine the application of statistical methods to sample data to both calibrate and evaluate the various models presented. Credibility theory and the valuation of financial derivatives will also be discussed. Throughout the semester students will have the opportunity to demonstrate their understanding through practice problems, quizzes, computer assignments and exams. The course is guided toward the professional actuarial exams; however, the actuarial exams will not determine the entire content or pace of the class. The course syllabus provides a general plan for the course; deviations announced to the class by the professor may be necessary.

Course Objectives
• Teach the theoretical foundations of actuarial mathematics.
• Develop critical thinking to solve complex problems from first principles rather than from memorization.
• Encourage students to present their own analysis in a confident, organized and coherent manner.
• Incorporate examples and problems, both in class and as assignments, that link theory with real world applications.
• Provide an opportunity to use computers in problem solving as computer work is critical for understanding Course C/Exam 4 material.
• Provide sufficient background for the Course C CAS/SOA exam.

Course Materials
• Supplemental readings and documents available from the class web page or distributed in class. (HO)

Academic Integrity
You are responsible for maintaining the highest standards of honesty and integrity in every phase of your academic career. The penalties for academic dishonesty are severe and ignorance is not an acceptable defense. All students must abide by the code of academic honesty of the University of Wisconsin – Madison which is available from the Office of the Dean of Students or the following website: http://www.wisc.edu/students/saja/misconduct/academic_misconduct.html. You are responsible for informing yourself about these standards before performing any academic work. It is my responsibility to uphold the University’s academic honest policy and report my suspicions of dishonesty to the Office of the Dean of Students.
**Attendance**

Lecture attendance is strongly advised. Exams will be based primarily on material covered in class. Should you miss a day of class for any reason, please get lecture notes from another student.

Class attendance is mandatory when guest speakers are scheduled. Guest speakers will be announced in advance. Failure to attend any guest speaker class session will result in a discretionary reduction of your course grade. Further, you are expected to be courteous and respectful to guest speakers. This includes arriving on time, being attentive, and demonstrating interest by participating and asking appropriate questions.

**Exam Policy**

There will be four exams during the semester, three midterms and one final exam. The midterm exams will not be cumulative, although there is some overlap in material from one midterm to the next. The final exam will be comprehensive, but with an emphasis on the most recent material. Exam topics will be announced the week prior to the exam. All exams will be closed book, closed notes, with the exception that you are allowed one (1) 8-1/2” x 11” sheet (both sides) of notes. For all exams, you are also expected to have a small electronic calculator, having at least one memory and capable of taking a logarithm, exponential and square roots. I will provide appendix tables based on appendices from the text that are consistent with the ones used for the professional actuarial exams. Exams will consist of quantitative problems and short answer questions. Exam material will come from lectures, text and any material distributed in class or through the course web page (see below).

Please do not miss an exam. If you should miss a midterm exam because of a University approved excuse (e.g. written medical excuse), your final exam score will be used as the score for the missed exam.

**Quizzes**

There will be weekly quizzes except for the exam weeks. There will be no make-ups for the quizzes. Quizzes are closed-book, closed note. Again, I will provide appendix tables based on appendices from the text.

Each weekly quiz will consist of one problem taken directly from the homework or text examples assigned during the previous week with at most some numbers simply changed. Quizzes will be during the first ten to fifteen minutes of class. Your lowest quiz score will be dropped.

**Grade Composition**

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<thead>
<tr>
<th>Exam</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>#1</td>
<td>15%</td>
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<tr>
<td>#2</td>
<td>20%</td>
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<tr>
<td>#3</td>
<td>20%</td>
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| Quizzes & Computer Assignments | 15% |

| Final Exam | 30% |

**Grade Scale**

Lower bounds for AB, BC, C, and D final grades will be no higher than 90, 80, 70, and 60 percent of the total available points, respectively. All other grades (A, B and F) will be determined at the end of the semester based upon the performance of the class. Grades will be curved if necessary.

**WEB Resources**

A course page has been established as a means for me to efficiently administer this class. The web page allows you to obtain a copy of the syllabus, obtain lecture notes, link to other important web pages, etc. You are responsible for accessing the course web page on a regular basis. You may log on to the web page through the following address: [http://courses.bus.wisc.edu](http://courses.bus.wisc.edu).

**Email**

Announcements regarding the class may be sent from me to you via mail. Any announcement sent via email is assumed to be communicated to the entire class. Thus, it is imperative you check your email regularly.

I will answer simple, factual questions via email; however, more thoughtful questions need to be asked during class, office hours, or review sessions. Email is useful for simple communication but is limited in the ability to develop firm understanding of material. Should you need to email me or a teaching assistant, please type ACT SCI 653 in the subject line. Otherwise, your email may be filtered into junk mail. I will respond to individual emails in a reasonable amount of time.
Actuarial Science, Risk Management and Insurance (ASRMI) Homepage

The address for the ASRMI homepage is http://www.bus.wisc.edu/asrmi/. For those interested in the major, you should familiarize yourself with this site. Important dates, events, and announcements related to the ASRMI program appear here, as well as information regarding Career Opportunities, Scholarships, Career Fair, and other important topics.

Actuarial Exam Information

The following websites provide useful information on actuarial exams related to this class.

CAS Spring 2008 Info: http://casact.org/admissions/syllabus/

Special Needs

Any student who feels that he or she may need an accommodation for a disability of any sort should consult with me as soon as possible so that appropriate arrangements may be made.
All readings are to be done prior to class. Additional material, such as handouts, notes, announcements, etc., may be retrieved from the course web page or will be distributed in class. Please come prepared.

*The schedule is subject to change. Actual depth of coverage will depend on available time.

**Construction of Empirical Models**
- Review of Mathematical Statistics: Chapter 9 (KPW)
- Estimation for Complete Data: Chapter 10 (KPW)
- Estimation for Modified Data: Chapter 11 (KPW)

**Parametric Statistical Methods**
- Parameter Estimation: Chapter 12 (excluding 12.5.4, 12.5.5 and 12.6) (KPW)
- Model Selection: Chapter 13 (KPW)

**Financial Derivatives**
- Lognormal Distribution: Derivatives Markets, Chapter 18 (HO)
- Monte Carlo Valuation: Derivatives Markets, Chapter 19 (HO)

**Adjusted Estimates and Simulation**
- Credibility: Chapter 16 (excluding 16.4.7, 16.5.3) (KPW)

**Important Dates**
- Exam #1: Thurs, February 14 (in class)
- No Class (Spring Recess): Tues, March 18 & Thurs, March 20
- Exam #2: Thurs, March 27 (in class)
- SOA/CAS Exam C/4 Registration Deadline: Tues, April 1
- Exam #3: Thurs, April 24 (in class)
- Last Day of Class: Thurs, May 8
- SOA/CAS Exam C/4: Weds, May 14, 8:30 a.m. – 12:30 p.m.
- Final Exam: Thurs, May 15, 7:45 a.m. – 9:45 a.m.