Instructor Information
Greg Wanner, ACAS
Office / Office Hours: 5252C Grainger / W 1:30 – 3:00 PM
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Course Description & Philosophy
This is the second part of a two-semester sequence covering the construction and evaluation of actuarial models. Loss Models II covers topics in statistics relevant to the construction of actuarial models. 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. Frequency and severity models will both be considered. Finally, credibility theory will also be discussed.

The exams (described below) will be based primarily on problems. Most of the course will be geared to helping work through the problems. Lectures will be devoted to explaining the key concepts of the material and working illustrative examples. Throughout the semester students will have the opportunity to demonstrate their understanding in various ways, including practice problems, computer examples, class participation, quizzes, 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.

Lecture material in this class will be based on class notes that will be posted on the course web-site. The notes are divided into 26 sets, and essentially, one set will be covered each class period, with multiple class periods devoted to longer or more complex sets of notes, and multiple sets of notes that pertain to lesser amounts or less complex material covered in a single class period. The course web-site provides a listing of the material expected to be covered each week in this class, both in terms of the applicable set of course notes and corresponding topics.

Course Objectives
- Understand the foundations of the construction and analysis of mathematical loss models.
- 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/Exam 4 SOA/CAS exam.

Course Materials
- A copy of this text along with its solutions manual is on reserve in the School of Business library.
- An errata document for this text for associated solutions manual has been provided on the class website.
- Supplemental readings and documents, as available from the class web page or distributed in class.
- BPP Exam C Question and Answer Bank at WSoB Copy Center (Grainger 1220; approx. $40).

Note: these are the same materials as used during the first semester portion of the Loss Models sequence.
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. You are responsible for informing yourself about these standards before performing any academic work, which is provided on the web-site of the Office of the Dean of Students at:
https://www.students.wisc.edu/doso/academic-integrity/

It is my responsibility to uphold the University’s academic honesty 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 class for any reason, it is your responsibility to obtain lecture notes from another student.

Personal Electronic Technology
As per the Wisconsin School of Business policy, the use of personal electronic technology (e.g. cell phone, iphone, ipod, blackberry, laptop computers, mp3 player, etc.) is not allowed during lectures or exams. We believe that classroom use of such technology can serve as a distraction for the user, classmates, and the instructor, and can hinder instruction and learning. Please be courteous to others and disable your device prior to lectures so it does not become a distraction. You may use a laptop computer for the sole purpose of taking notes during lecture. If you choose to do so, you must sit in the designated area where laptop computers are allowed. Any student who uses other technology during lecture will simply be asked to leave. Any student who uses any of the above mentioned technology during an exam is in violation of the code of academic honesty of the University of Wisconsin – Madison.

Exam Policy
There will be three exams during the semester, two 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. At this time, the final exam also is not planned to be cumulative, but plans for the final are subject to change. The material to be covered on each exam will be disclosed in class, as well as posted on the course web-site. This includes plans for the final exam.

All exams will be closed book and closed 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. Appendix tables that primarily consist of Appendix A and a portion of Appendix B in the text will be provided. These are the tables 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. This includes a quiz the first week of class. Make-up of missed quizzes will be allowed in approved circumstances. Quizzes are closed-book, closed note.

Each weekly quiz will generally occur during the second class period of the week, during the first 10-15 minutes of class. However, quizzes may sometimes be moved to the end of a class period or assigned on a take-home basis based on the state of the progress made on coverage of relevant material, other developments during the course of the semester, or the nature of the material. Each quiz will consist of one problem based on the current homework assigned, or text and lecture examples discussed during current class periods. Please refer to the next section on “Grade Composition” for the point value of each quiz. All quiz scores will be included in determining your final grade – no quiz scores will be dropped.

Grade Composition
Grades for Act Sci 653 will be based on awarding students points for exams, quizzes, and class participation, as follows:

1. **Exam Policy**
2. **Quizzes**
3. **Grade Composition**
<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Points per Occurrence</th>
<th>% of Total per Occurrence</th>
<th>Points per Category</th>
<th>% of Total per Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>3</td>
<td>75</td>
<td>25.9%</td>
<td>225</td>
<td>77.6%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>13</td>
<td>5</td>
<td>1.7%</td>
<td>65</td>
<td>22.4%</td>
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</table>

### Grade Scale

Grades are based on a student’s average of the total available points in the course. The following scale provides the maximum (i.e., highest possible) cut-offs for each letter grade:

- A 95-100%
- AB 90-94.99%
- B 85-89.99%
- BC 80-84.99%
- C 70-79.99%
- D 60-69.99%
- F 0-59.99%

For example, the cut-off to receive an A will be no higher than 95%, and, based on past standards, it is likely to be lower. The scale is a preliminary guide, and may be adjusted (curved) if it is deemed an inaccurate representation of student achievement and relative mastery of the material. Historically, a semester average of about 88% to 90% has been sufficient to get an A. However, past performance is no guarantee of future outcomes, and so any adjustments to the scale for this semester will depend on the overall performance of all students in the class. If you expect to earn an A in this class, you may not need to attain an average of 95%, but doing so will remove all uncertainty and guarantee that you will receive an A.

### Final Grading

The above grade scale information provides guarantees that, for example, an average above 90% will earn a grade of AB or higher. However, the fact that grades will be curved as necessary indicates that both absolute and relative measures of student performance will be used to assess student learning in this class.

Similarly, other of the above disclosures on grading may be adjusted during the course of the semester as necessary. No drastic changes will be made. But slight adjustments may be made, for example, to the weights assigned to each exam, whether exams will be cumulative or distinct, and so on, based on how the semester proceeds. Any adjustments will be made to better correspond to the pace of the course and to facilitate more accurate evaluation of student learning, and are not intended to result in more stringent grading.

### 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: [https://courses.bus.wisc.edu](https://courses.bus.wisc.edu).

Additional, official sample problems and solutions (some with video), provided by the SOA and CAS are available through our own Technology Enhanced Learning in Actuarial Science website devoted to Course C Problems: [http://instruction.bus.wisc.edu/jfrees/UWCAELearn/Lists/Course%20C%20Problems/AllItems.aspx](http://instruction.bus.wisc.edu/jfrees/UWCAELearn/Lists/Course%20C%20Problems/AllItems.aspx)

For helpful reviews of calculus and probability ideas, see: [https://www.khanacademy.org/](https://www.khanacademy.org/)

### E-mail

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

I will answer simple, factual questions via e-mail; however, more thoughtful questions need to be asked during class, office hours, or review sessions. E-mail is useful for simple communication but is limited in the ability to develop firm understanding of material. Should you need to e-mail me, please type AS 653 in the
subject line. Otherwise, your e-mail may be filtered into junk mail. I will respond to individual e-mails in a reasonable amount of time. In some cases, the response may be to request that you stop by my office to discuss the matter in person.

**Actuarial Science, Risk Management and Insurance (ASRMI) Homepage**

The address for the ASRMI homepage is [http://bus.wisc.edu/knowledge-expertise/academic-departments/actuarial-science-risk-management-insurance](http://bus.wisc.edu/knowledge-expertise/academic-departments/actuarial-science-risk-management-insurance). 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, the ASRMI Career Fair, and other important topics.

**Actuarial Exam Information**

The following websites provide useful information on actuarial exams related to this class. Because these url’s frequently change, you may wish to simply use [www.soa.org](http://www.soa.org) and [www.beanactuary.org](http://www.beanactuary.org) as starting points.

- **SOA Spring 2016 Info:** [http://soa.org/education/general-info/](http://soa.org/education/general-info/)
- **SOA Course C Exam:** [http://soa.org/education/exam-req/edu-exam-c-detail.aspx](http://soa.org/education/exam-req/edu-exam-c-detail.aspx)

**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.

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SPRING 2016
Act Sci 653 – Loss Models II

Schedule of Topics

Please refer to the general information section of the course web-site for a document which lists, week by week and class period by class period, the planned overall schedule for this class. Please also refer to the course web-site, which will be updated on a weekly basis to show the current lecture notes, current suggested practice problems, and other information relevant to the current course material.

Important Dates

First Day of Class: Tu, January 19
Exam #1: Th, February 18 (in class)
Spring Break: Sa, March 19 thru Su, March 27
Exam #2: Th, March 31 (in class)
SOA Exam MLC (no class planned): Tu, May 3
Last Day of Class: Th, May 5
Final Exam: Tu, May 10 (10:05 AM – 12:05 PM)
Registration Deadline for Exam C (June sitting): We, May 11
SOA Exam C (June sitting – pencil and paper version): Tu, June 21
SOA Exam C (June window – CBT version): Tu, June 21 thru M, June 27

[ E N D   O F   D O C U M E N T ]
Spring 2015  
ACT SCI 653 – Loss Models II  
Schedule of Topics*

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. Mid-term #1 is anticipated to cover Chapters 10 to 12, and Mid-term #2 is anticipated to cover Chapters 13 to 15.

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<th>Construction of Empirical Models</th>
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<td>Review of Mathematical Statistics</td>
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<td>Estimation for Complete Data</td>
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<td>Estimation for Modified Data</td>
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<th>Parametric Statistical Methods</th>
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<td>Frequentist Estimation for Discrete Distributions</td>
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<th>Adjusted Estimates</th>
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<tr>
<td>Limited Fluctuation Credibility</td>
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<td>Greatest Accuracy Credibility</td>
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<td>Empirical Bayes Parameter Estimation</td>
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