

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
DHAHRAN, SAUDI ARABIA

AS 483: Actuarial Risk Theory and Credibility
Term 172 – Spring 2017

Instructor: Abedalhay Elmughrabi, MS Actuarial Science & MS Mathematics
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Office Hours: UTR 09:00 AM – 09:50 PM & Monday 11:00 AM – 12:00 PM or by appointment

Time: UTR 08:00 AM – 09:00 AM
Place: Building 6 – Room 166

Prerequisite: STAT 416
Credit Hours: (3-0-3)

Course Description:

Distribution of aggregate claims associated with insurance including analysis of the risk due to variations in expected claim numbers and amounts. Frequency and severity distributions, individual and collective models, ruin theory, continuous-time compound Poisson surplus processes, reinsurance, dividend formulas, credibility models, and simulation. An introduction to empirical Bayes and statistical distributions used to model loss experience. Application of risk theory to the operation of insurance and Takaful system and assessment of the credibility of data for ratemaking.

Course Material:

1. Course Syllabus: (Posted on Blackboard)
2. Text: **Klugman, S. A., Panjer, H. H., and Willmot, G. E. (2012). Loss Models: from Data to Decisions 4th edition. John Wiley and Sons.**
3. Class Notes: (Posted on Black Board)
4. Calculator: Texas BAII Plus Calculator or Texas BAII Professional
5. SOA Exam C reading selection for credibility (1) <http://www.soa.org/files/pdf/C-21-01.pdf>
6. SOA Exam C reading selection for credibility (2) <http://www.soa.org/files/pdf/c-24-05.pdf>

Supplemental Course Material:

1. Formula Sheets and Flash Cards: (Posted on Blackboard)
2. October, 2017 Exam C Syllabus as given by SOA.
<https://www.soa.org/education/exam-req/edu-exam-c-detail.aspx>
3. Tables for Exam C:
<https://www.soa.org/education/exam-req/edu-exam-c-detail.aspx>
4. Exam C sample Questions (Only those related to AS 483 coverage of Exam C material):
<https://www.soa.org/Education/Resources/Cae/edu-soa-sponsored-study-resources.aspx>
5. Exam C Past Exams Questions (Only those related to AS 483 coverage of Exam C material):
<https://www.soa.org/education/exam-req/syllabus-study-materials/edu-multiple-choice-exam.aspx>

Attendance:

The student is responsible for all material presented in class. Some of the material presented in class might not be in the textbook. Generally, attendance will be checked once the teacher enters the class room. Entering the class after that, is considered as late where two late cases will be considered as one Absence. Students' late more than 10 minutes will be considered absent regardless of any excuse. Unexcused absences and late cases might be penalized by grade deductions as announced by the instructor. Excessive unexcused absences will result in a grade of **DN** in accordance with University rules.

Communication:

For regular announcements, students are advised to check Blackboard regularly.

Grading:

Your course grade will be based on the total of points accumulated on class work (60 points: 20 points Homework & 40 Points Quizzes), two major exams (100 points each), and Final Exam (140 points). The following scale gives the cut-off points for the course grades.

Letter grade	A+	A	B+	B	C+	C	D+	D	F	DN
Cut-off	90%	85%	80%	75%	67%	60%	55%	50%	<50%	≥ 9 absences

Activity	Weight
Exam 1 Exam 1 Date: February 25th, 2018 , Time and Location TBA	100 points (25%)
Exam 2 Exam 2 Date: April 1st, 2018 , Time and Location TBA	100 points (25%)
Class Work In class	60 points (15%)
Final Exam (Comprehensive) Final Exam Date: May 7th, 2018, Time: 8:00 AM–11:00 AM	140 points (35%)

Missing Exam I or II:

No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the existing formula, which depends on his performance in the non-missed exam and in the final exam. It is to the professor's discretion whether to accept or refuse the student's excuse for missing an exam.

Exam Questions:

The questions of the common exams are based on class examples and at home practice problems.

General Comments:

- It is essential that you keep up with the material as it is presented. This, unfortunately, is not one of those course where it is possible to catch up the last minute. In particular, it is important to do the problems as the material is presented.
- I encourage you to discuss the assigned problems with other students and work on them in groups. Discussing the assigned problems with others will also help you explain them clearly in the quizzes or exams.
- Students are required to carry pens, note-taking equipment and a calculator to EVERY lecture and exam. It is strongly recommended to keep a binder for class-notes.
- Bonus points might be awarded for showing alertness and participation in class discussions.
- The schedule is tentative and might be adjusted based on the progress of the class.
- To successfully prepare for the SOA exams, students MUST solve problems regularly. The selected assigned problems are specifically designed to prepare you for major and final exams, and SOA Exam FM. So, it is expected that you complete these problems step-by-step and with comprehension.
- For every exam, so you need to bring with you *pens, pencils, a sharpener, an eraser, and a SOA approved calculator.*

Student Learning Outcomes:

<https://www.soa.org/education/exam-req/edu-exam-c-detail.aspx>

Academic Integrity:

All KFUPM policies regarding **ethics** and **academic honesty** apply to this course.

Week	Date	Topic	Important Dates
1	Jan. 21-25	Probability Review & Chapter 3: Basic Distributional Quantities	
2	Jan 28.- Feb. 1	Chapter 3: Basic Distributional Quantities (Continued)	
3	Feb. 04-08	Chapter 4: Characteristics of Actuarial Models	
4	Feb. 11-15	Chapter 5: Continuous Models	
5	Feb. 18-22	Chapter 6: Discrete Distributions	
6	Feb. 25- Mar. 01	Chapter 8: Frequency & Severity with Coverage modifications	Feb 25th: First Major Exam.
7	Mar. 04-08	Chapter 9: Aggregate Models	
8	Mar. 11-15	Chapter 9: Aggregate Models (Continued)	
9	Mar. 18-22	Chapter 10: Review of Mathematical Statistics (New Material Only) & Chapter 13: Frequentist Estimation.	
10	Mar. 25-29	Chapter 15: Bayesian Estimation.	
11	Apr. 01-05	Chapter 17: Introduction and Limited Fluctuation Credibility.	April 1st : Second Major Exam
12	Apr. 08-12	Chapter 18: Greatest Accuracy Credibility.	
13	Apr. 15-19	Chapter 19: Empirical Bayes Credibility.	
14	Apr. 22-26	Chapter 20: Simulation	
15	Apr. 29- May 03	Review	
Final Examination			
Day: Monday Date: May 7th, 2018 Time: Location: TBA			