



جامعة الملك فهد للبترول والمعادن  
King Fahd University of Petroleum & Minerals

# KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

DHAHRAN, 31261, Kingdom of Saudi Arabia

## AS 483: Actuarial Risk Theory & Credibility

Term 161 – fall 2016

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**Instructor:** Mr. Moenes Mellouli, MA MS MBA

**Office:** Building – 5, Room – 320 **Phone:** 7630 **E-mail:** [mmellouli@kfupm.edu.sa](mailto:mmellouli@kfupm.edu.sa)

**Office Hours:** Sunday, Tuesday and Thursday: 8:00 – 9:40 am or by appointment.

**Class meeting Days:** UTR 13:10 – 14:00 pm. Building – 4, Room - 259

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

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### Course Descriptions:

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.

**Credit:** (3 – 0 – 3).

**Prerequisite:** Stat 416

## Textbook, Package & Reading Selections:

- 1- Loss Models: From Data to Decisions, (Fourth Edition), 2012, by Klugman, S.A., Panjer, H.H. and Willmot, G.E., John Wiley & Sons, ISBN: 978-1-118-31532-3.
  - 2- ACTEX SOA exam C study manual, December 2014 edition, by Broverman
  - 3- Texas BAII plus calculator or Texas BAII professional or check for other SOA approved calculators
  - 4- <http://www.soa.org/files/pdf/C-21-01.pdf>
  - 5- <http://www.soa.org/files/pdf/C-24-05.pdf>
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## Learning Objectives:

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

## Activity Schedule:

Assessment for this course is based on a set of HW, *two major exams* and a *comprehensive final exam*, as described in the following table:

Activity
HW (15%)
Major Exam I (25%) Date: <b>Wednesday, November 8, 2016</b> Time: <b>TBA</b> Location: <b>Building 4-259</b>
Major Exam II (25%) Date: <b>Sunday, December 27, 2016</b> Time: <b>TBA</b> Location: <b>Building 4-259</b>
Final Exam (Comprehensive) (35%) Date: <b>TBA</b> Time: <b>TBA</b> Location: <b>TBA</b>

## Attendance, cell phone use & other penalties:

- ✓ Attendance on time is *very* important. A 1% will be deducted from your final grade if you enter the class when the door is closed. **No excuses will be accepted.**
- ✓ Notebook & pen/pencil are mandatory. A 1% will be deducted from your final grade if you enter the class without your Financial Mathematics notebook and something to write with. **No excuses will be accepted**
- ✓ Full attention in class - A 1% will be deducted from your final grade if you are seen using your cellphone for texting or surfing the web. **No excuses will be accepted.**
- ✓ In accordance with the University rules, "a grade of **DN** in a course is given if the student's unexcused absences are more than 20% of the lecture sessions scheduled for the course". Therefore, students who accumulate **12, or more, unexcused absences** will receive a DN grade.

## Letter 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

## Exam Questions:

- ❖ The questions of HW & major exams are based on the in class examples & at home practice problems.

## Missing Exam I or Exam II or Exam III:

- 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 exams 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.

## General class information:

- Students are required to carry a pen/pencil, notebook and a SOA approved calculator to EVERY lecture.
- Students are required to carry a pen/pencil, a sharpener, and eraser and a SOA approved calculator to every exam.

## General SOA FM exam information:

- To successfully prepare for the SOA C exam, students MUST solve problems regularly. The selected assigned problems are specifically designed to prepare you for quizzes, major and final exams and the SOA C exam. So, it is expected that you complete these problems step-by-step and with comprehension.
- The SOA C examination is a four and a half hour multiple-choice examination.

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

**AS 483 – Actuarial Risk Theory & Credibility  
2016-2017 (161)**

**Notes:** The pace of coverage and material to be covered given in this table is tentative and may be modified when needed.

<b>Week</b>	<b>Date</b>	<b>Sec.</b>
<b>Module 1 - MODELING</b>		
1	Sep.18-22	<ul style="list-style-type: none"> <li>• Probability Review</li> <li>• Random Variables Review</li> </ul>
2	Sep. 25-Sep. 29	<b>Chapter 3</b>
3	Oct. 2-6	<b>Chapter 4</b>
4	Oct.9-13	<b>Chapter 5</b>
5	Oct. 16-20	<b>Chapter 6</b>
6	Oct. 23-27 October 27 – Last day to drop a course with W	<b>Chapter 8</b>
7	Oct. 30- Nov. 3	<b>Chapter 9</b>
8	Nov. 6-10	<b>Catch up &amp; review</b>
<b>Nov. 13-17: Mid Term Break</b>		
<b>Module 2 – CREDIBILITY** &amp; SIMULATION</b>		
9	Nov. 20-24	<b>Chapter 15</b>
10	Nov. 27- Dec. 1	<b>Chapter 17**</b>
11	Dec. 4-8	<b>Chapter 18**</b>
12	Dec. 11-15	<b>Chapter 19**</b>
13	Dec. 18-22	<b>SIMULATION – Chapter 20</b>
14	Dec. 25-29	<b>Catch Up &amp; Review</b>
<b>Module 3 - MODEL ESTIMATION</b>		
15	Jan. 1-5	<b>Chapter 10</b>
16	Jan. 8	<b>Last day of class - Review</b>

**\*\* Reading Selections for Credibility:**

- 1- <http://www.soa.org/files/pdf/C-21-01.pdf>
- 2- <http://www.soa.org/files/pdf/C-24-05.pdf>