

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

**AS380: Actuarial Contingencies I - Term 241 (2-2-3) 9am UT**

**Course Objectives:**

Introduction to life insurance mathematics based on a stochastic approach. Life insurance, annuities, benefit premiums, and net reserves. Parallel treatment of topics based on Takaful system.

**Prerequisites:** AS 201 and STAT 301

**Textbook and Package:**

- Dickson, D.C., Hardy, M. R., & Waters, H. R. (2020) *Actuarial Mathematics for Life Contingent Risks*, 3<sup>rd</sup> edition. Cambridge University Press: Cambridge, UK.
- Texas BAII Plus Calculator or Texas BAII Professional
- Li & Ng (2020). *ACTEX Study Manual for SOA Exam LTAM*. ACTEX. ISBN: 978-1-63588-929-1

**Reference:**

- Bowers N., Gerber, H., Hickman, J., Jones, D. & Nesbitt, C. (1997 or later printing) *Actuarial Mathematics*, 2nd edition. Society of Actuaries Publishing.
- LTAM exam syllabus on SOA site.

**Instructor:** Dr. Ridwan A. Sanusi

**Office:** Bldg – 5, room – 203/2. **Phone:** 1054

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**Office Hours:** U (10.00 - 10.50am), T (10.00am-10.50am), and W (2.20PM – 3.10PM) or by appointment via email or Teams.

**Assessment**

Assessment for this course will be based on the following:

Activity	Weight
Attendance**+, Quiz*, and homework*	20% (5+10+5)%
Labwork and Lab Exam	10% (5+5)%
Mid Term (Chapters 1, 2 & 3) <b>Tuesday (Oct 1 – week 6), 6.00 pm</b>	20%
Term Paper Report + presentation <b>Sunday (Nov 6 - week 11)</b>	10%+5%
Final Exam (Comprehensive) <b>As announced by Registrar</b>	35%

\* for both coursework and labwork; + >8 absences = zero mark for attendance

**IMPORTANT NOTE on GRADES:** There is no quota on the number of students who can get an A+ grade.

- ✓ **Attendance** on time is *very* important. Mostly, attendance will be checked within the *first five minutes* of the class. Entering the class after that, is considered as late (**2 lates= 1 Absence**) and
- ✓ **More than 10 minutes late = Absence** (regardless of any excuse).

Letter grade	A+	A	B+	B	C+	C	D+	D	F	DN
Cut-off	90%	85%	80%	75%	70%	60%	55%	50%	<50%	> 9 absences

**General Notes:**

- Students are required to carry **pens, note-taking equipment** and a **calculator** to **EVERY lecture and exams**. It is strongly recommended to keep a **binder** for class-notes.
- Students are also expected to bring the book, take notes and organize their solved questions in a **binder** for easy retrieval to help them in study and review for class, exams, etc
  - It is to the student's advantage to keep a binder for storing class notes, homework, and other graded assignments. Students who are **organized** will find it **easier** to find important materials when **studying for exams**.
- To successfully prepare for the SOA exams, students **MUST solve problems** regularly and with discipline. The selected assigned problems are specifically designed to prepare you for major and final exams. So, it is expected that you complete these problems **step-by-step** and **with comprehension**.
  - If you happen to stumble upon a solution manual somewhere, remember 2 important points. (1) Due to publishing costs and deadlines, these solutions are brief and may have mistakes and (2) in your career as an actuary and your exams and quizzes in this class, you are expected to know every step to a problem and to know if a solution is incorrect. Thus, the best way to solve problem is without these brief solutions.
- **Never round** your intermediate results to problems when doing your calculations. This will cause you to lose calculation accuracy. Your answers may then be different from the SOA exam key even when you use the right procedure.
- For every exam, so you need to bring with you **pens, pencils, a sharpener, an eraser**, and a **SOA approved calculator**.
- Students should wait until completion of the next course AS482 before they attempt to take the professional exam MLC.

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

**Exams:**

**Exam Questions:** The questions of the exams are based on the examples, homework problems, and exercises in the textbook and lab manual.

**Cheating in Exams:** Cheating or any attempt of cheating by use of illegal activities, techniques and forms of fraud will result in a grade of F in the course along with reporting the incident to the higher university administration. Cheating in exams includes (but not restricted to)

- Looking at the papers of other students,
- Talking to other students,
- Using mobiles or any other electronic devices.

**Exam Issues:**

- No student will be allowed to take the exam if not having his/her KFUPM ID or National/Iqama ID.
- Students are not allowed to carry mobiles, smart watches, or electronic devices to the exam halls/rooms.
- Students must take the exam in the place assigned to them.

**Missing an Exam:**

In case a student misses an exam (Exam I, Exam II, or the Final Exam) for a legitimate reason (such as medical emergencies), he must bring an official excuse from Students Affairs with the “Exam Included” box checked. Otherwise, he will get zero in the missed exam.

**Attendance:** Students must adhere to the attendance policy of KFUPM. Students are expected to attend all lecture and labs.

- If a student misses a class, he is responsible for any announcement made in that class.
- A DN grade will be assigned to the eligible student after being warned twice by his/her instructor.
- A DN grade will be awarded to any student who accumulates
  - 9 unexcused absences in lecture and labs. (20%)
  - 15 excused and unexcused absences in lecture and recitation classes. (33%)

**Note:**

- **Attendance** on time is *very* important. Mostly, attendance will be checked within the *first five minutes* of the class. Entering the class after that, is considered as late (**2 lates= 1 Absence**) and
- **More than 10 minutes late = Absence** (regardless of any excuse).
- Only University Blue paper Official excuses will be accepted as valid excuse.

Absences are counted as follows:

- Missing a lab is counted as 2 absences.
- Missing a lecture is counted as 1 absence.

**Student Learning Outcomes:** See Society of Actuaries Exam LTAM (Long-Term Actuarial Mathematics – Spr 2022) LO.

**Syllabus (Tentative)**

<i>Week</i>	<i>Sections</i>	<i>Topics</i>	<i>Notes</i>
<b>1</b> (Aug 25 - Aug 29)	Ch 1	<b>Brief Introduction to Insurance Contracts:</b>	
<b>2</b> (Sep. 1- 5)	Ch 2	<b>Survival Distribution</b>	
<b>3</b> (Sep. 8 - 12)	Ch 2 Ch 3	<b>Survival Distribution (continued)</b> <b>Life Table</b>	<b>Declare your Term paper topic: Sun Sep 8</b>
<b>4</b> (Sep. 15 - 19)	Ch 3	<b>Life Table (cont.)</b>	
<b>5</b> (Sep. 22 - 26)	Ch 4	<b>Life Insurance</b>	Sept 22-23: Natl Day Holiday
<b>Tuesday (Oct 1– week 6) , 6.00 pm – Midterm Exam (chapters 1, 2 &amp; 3)</b>			
<b>6</b> (Sep. 29 - Oct. 3)	Ch 4	<b>Life Insurance (continued).</b>	
<b>7</b> (Oct. 6 - 10)	Ch 5	<b>Life Annuities.</b>	<b>(2 wks):</b> Midterm grade reports starts
<b>8</b> (Oct. 13 - 17)			
<b>9</b> (Oct. 20 - 24)	Ch 5	<b>Life Annuities (cont.)</b>	

<b>10</b> (Oct 27 - 31)	Ch 6	<b>Benefit premiums</b>	
<b>Sun Nov 3: Term Paper Report due to instructor</b>			
<b>11</b> (Nov. 3 - 7)	Ch 6	<b>Benefit premiums (continued)</b>	
<b>Midterm Break: Nov. 10 - 14</b>			
<b>12</b> (Nov. 17 - 21)	Ch 7 (excl 7.2.5, 7.5, 7.6, 7.9)	<b>Policy values</b>	<b>presentations.</b>
<b>13</b> (Nov. 24 - 28)	Ch 7	<b>Policy values (cont.)</b>	
<b>14</b> (Dec. 1- 5)	Ch 7	<b>Policy values (cont.)</b>	
<b>15</b> (Dec. 8 - 12)	Assigned reading	<b>Concept of Mutual Insurance and Introduction to Takaful.</b>	
<b>16</b> (Dec. 16)		<b>Review</b>	Normal Monday Class
<b>Final Exam (Comprehensive): will be announced by Registrar</b>			

<i>Homework</i>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<i>Chapter</i>	<b>Ch 1</b>	<b>Ch 2</b>	<b>Ch 3</b>	<b>Ch 4</b>	<b>Ch 5</b>	<b>Ch 6</b>	<b>Ch 7</b>
<i>Problems</i>	<b>1.6 &amp; 1.10</b>	<b>2.2, 2.3, &amp; 2.6</b>	<b>3.2, &amp; 3.4</b>	<b>4.1 &amp; 4.6</b>	<b>5.4, &amp; 5.14</b>	<b>6.2 &amp; 6.8</b>	<b>7.6 &amp; 7.9</b>