

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

**AS288: Actuarial Science Problem Lab 1 (162)**

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**Office Hours:** UTR 08:10 AM – 09:50 AM or by appointment

**Time:** W 09:00 AM – 09:50 AM  
**Place:** Building 59 – Room 1011

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

**Prerequisite:** AS 201

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**Course Description:**

This problem lab is designed to prepare Actuarial majors for the second Society of Actuaries and Casualty Actuarial Society Examinations, FM/2 (Financial Mathematics). Participation in this course does not guarantee a student will pass the FM exam but this course provides a good start in preparing students towards that goal. The responsibility of passing the FM exam relies on the individual students.

**Course Material:**

1. Course Syllabus: ( Posted on Blackboard)
2. Text: Hassett, M. J., Ratliff, M.I., Garcia, T. C., and Steeby, A. C. (2014). *ACTEX FM/2 Study Manual*, 2014 Edition. ACTEX.
3. Calculator: Texas BAI Plus Calculator or Texas BAI Professional

**Supplemental Course Material:**

1. References:
  - a. Mathematics of Investment and Credit, 5<sup>th</sup> edition, by Broverman, S.A., ACTEX Publications Inc. (2010).
  - b. McDonald, R. (2006) *Derivatives Markets* (2<sup>nd</sup> Edition) Addison-Wesley/Prentice Hall
2. Formula Sheets ( Posted on Blackboard)
3. Flash Cards ( Obtained from KFUPM Book Shop )
4. February, 2017 Exam FM Syllabus as given by SOA.  
<https://www.soa.org/Files/Edu/2017/edu-2017-02-exam-fm-syllabus.pdf>
5. Exam FM sample Questions:  
<https://www.soa.org/Education/Resources/Cae/edu-soa-sponsored-study-resources.aspx>
6. Exam FM Past Exams Questions:  
<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 and class notes. 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. Excessive unexcused absences will result in a grade of DN in accordance with University rules.

## Grading:

Your course grade will be based on the total of points accumulated on the quizzes (75 points), two major exams (125 points each), and Final Exam (175 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%	≥ 6 absences

Activity	Weight
Exam 1 (Chapters 3, 4, 5, & 6) <b>Wednesday (Mar 12) , Time and Location TBA</b>	125 points (25%)
Exam 2 (Chapters 8, 9, 10, & 14) <b>(May 10), Time and Location TBA</b>	125 points (25%)
Professional Exam Preparation Project <b>In class</b>	75 points (15%)
Final Exam (Comprehensive) <b>Monday May 29<sup>th</sup> (as posted on registrar website)</b>	175 points (35%)

## NOTES:

1. There is no quota on the number of students who can get an A+ or F grade.
2. 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.

### Learning Objectives:

- <https://www.soa.org/Files/Edu/2017/edu-2017-02-exam-fm-syllabus.pdf>

## 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.
- 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. In this course, you will earn credit for a solution to a problem only if you provide a detailed and clear explanation that shows you completely understand the solution.
- 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.
- 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.

<i>Week</i>	<i>Dates</i>	<i>Modules</i>	<i>Topic</i>	<i>Notes</i>
1	Feb 5 <sup>th</sup> - Feb 9 <sup>th</sup>	1 & 2	<b>Interest Rates and Time Value of Money &amp; Annuities</b>	
2	Feb 12 <sup>th</sup> - Feb 16 <sup>th</sup>	2	<b>Annuities</b>	
3	Feb 19 <sup>th</sup> - Feb 23 <sup>rd</sup>	3	<b>Loan Repayment &amp; Bonds</b>	
4	Feb 26 <sup>th</sup> - Mar 2 <sup>nd</sup>	4 & 5	<b>Term Structure of Interest Rates &amp; Yield Rate of Investment</b>	
5	Mar 5 <sup>th</sup> - Mar 9 <sup>th</sup>	6 & 7	<b>Asset Liability Management, Duration &amp; Immunization</b>	
6	Mar 12 <sup>th</sup> - Mar 16 <sup>th</sup>	1-7	<b>Practice Problems</b>	
<b>Wednesday, Mar 15 – 1st Major Exam (Modules 1-7)</b>				
7	Mar 19 <sup>th</sup> - Mar 23 <sup>rd</sup>	8 & 9	<b>Introduction to Derivatives Securities</b>	
8	Mar 26 <sup>th</sup> - Mar 30 <sup>th</sup>	9	<b>Introduction to Forwards, Futures, and Call and Put Options</b>	
	Apr 2 <sup>nd</sup> - Apr 6 <sup>th</sup>	<b>Midterm Break</b>		
9	Apr 9 <sup>th</sup> - Apr 13 <sup>th</sup>	10	<b>Investment Strategies Combining Options, Futures, and Other Assets</b>	
10	Apr 16 <sup>th</sup> - Apr 20 <sup>th</sup>	11	<b>Using Derivatives to Manage Risk</b>	
11	Apr 23 <sup>rd</sup> - Apr 27 <sup>th</sup>	12	<b>Financial Forwards and Futures</b>	
12	Apr 30 <sup>th</sup> - May 4 <sup>th</sup>	13 & 14	<b>Swaps</b>	
13	May 7 <sup>th</sup> - May 11 <sup>th</sup>	8-14	<b>Practice Problems</b>	
<b>Wednesday, May 10 – 2nd Major Exam (Modules 8-16)</b>				
14	May 14 <sup>th</sup> - May 18 <sup>th</sup>	<b>Practice Problems</b>		
15	May 21 <sup>st</sup> - May 25 <sup>th</sup>	1-16	<b>Review</b>	
16	<b>Monday</b> May 29 <sup>th</sup>	<b>"Comprehensive" Final Exam</b>		

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