

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

AS 289: Actuarial Science Problem Lab I  
Term 192 – Fall 2019

**Instructor:** Ali N. Duman  
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**Office Hours:** UT 8:00 AM – 9:00 AM, R 9:00 AM – 10:50 or by appointment

**Time:** R 12:00 – 13:50  
**Place:** TBA

**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. Textbook: 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 BA II Plus Calculator or Texas BA II Professional.

**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, two major exams, and Final Exam. 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
Class Work (Quizzes+Class participation+Attendance)	80 points (20%)
Exam 1 <b>Date: TBA, Time and Location: TBA</b>	100 points (25%)
Exam 2 <b>Date: TBA, Time and Location: TBA</b>	100 points (25%)
Final Exam (Comprehensive) <b>Final Exam Date : TBA Time: TBA</b>	120 points (30%)

## 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.

## 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, you need to bring with you *pens, pencils, a sharpener, an eraser, and a SOA approved calculator.*

## Academic Integrity:

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

<b>Week</b>	<b>Date</b>	<b>Topics</b>	<b>Important Dates</b>
<b>1</b>	<b>Jan 19<sup>th</sup> – Jan 23<sup>th</sup></b>	<b>Interest rate Measurement</b> Interest Accumulation and Effective Rates of Interest Present Value Equation of Value Nominal rates of Interest Effective and Nominal Rates of Discount	
<b>2</b>	<b>Jan 26<sup>th</sup> – Jan 30<sup>th</sup></b>	The force of Interest Inflation and the “Real” rate of Interest Level Payment Annuities	
<b>3</b>	<b>Feb 2<sup>nd</sup> – Feb 6<sup>th</sup></b>	<b>Valuation of Annuities</b> Level Payment Annuities Level payment Annuities – Some Generalizations	
<b>4</b>	<b>Feb 9<sup>th</sup> – Jan 13<sup>st</sup></b>	Annuities with Non-Constant payment Applications and Illustrations	
<b>5</b>	<b>Feb 16<sup>th</sup> – Feb 20<sup>th</sup></b>	<b>Loan Repayment</b> The amortization model of Loan Repayment Amortization of a Loan with Level Payments	First Major Exam
<b>6</b>	<b>Feb 23<sup>rd</sup> – Feb 27<sup>th</sup></b>	<b>Bond Valuation</b> Determination of Bond Prices Amortization of a Bond Applications and Illustrations	
<b>7</b>	<b>Mar 1<sup>st</sup> – Mar 5<sup>th</sup></b>	<b>Measuring the Rate of Return of an Investment</b> Internal Rate of Return defined and Net Present Value Dollar-weighted and Time-Weighted Rate of return Applications and Illustrations	
<b>8</b>	<b>Mar 8<sup>th</sup> – Feb 12<sup>th</sup></b>	<b>The term structure of interest rates</b> Spot Rates of Interest Forward rates of Interest	
<b>9</b>	<b>Mar 15<sup>th</sup> – Mar 19<sup>th</sup></b>	<b>Cash flow duration and Immunization</b> Duration of a set of Cash flows and Bond duration	
<b>10</b>	<b>Mar 22<sup>nd</sup> – Mar 26<sup>th</sup></b>	Asset-liability Matching and Immunization Additional Topics in Finance and Investment The dividend discount model of stock valuation	
<b>11</b>	<b>Mar 29<sup>th</sup> – Apr 2<sup>nd</sup></b>	Using Duration and Convexity to approximate change in present value.	Second Major Exam
<b>12</b>	<b>Apr 5<sup>th</sup> – Apr 9<sup>th</sup></b>	Interest Rate Swaps	
<b>13</b>	<b>Apr 12<sup>st</sup> – Apr 16<sup>th</sup></b>	Determinants of Interest rates	
<b>14</b>	<b>Apr 19<sup>th</sup> – Apr 23<sup>th</sup></b>	Review \ Exam FM Practice Problems	
<b>15</b>	<b>Apr 26<sup>th</sup> – Apr 30<sup>th</sup></b>	Review \ Exam FM Practice Problems	