

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

AS 388: Actuarial Science Problem Lab II  
Term 191 – Fall 2019

**Instructor:** Abedalhay Elmughrabi, MS Actuarial Science & MS Mathematics  
**Office:** Building 5 – Room 318  
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**Office Hours:** UTR 10:00 AM – 10:50 AM or by appointment

**Time:** W 09:00 AM – 09:50 AM  
**Place:** Building 6 – Room 163

**Prerequisite:** STAT 301  
**Credit Hours:** (0-0-1)

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**Course Description:**

This problem lab is designed to prepare Actuarial majors for the first Society of Actuaries (SOA) and Casualty Actuarial Society (CSA) Examinations, Exam P (Probability). Students are assumed to have taken the appropriate prerequisite courses (STAT301 or equivalent) prior to registering for this society exam preparation lab.

**Course Material:**

1. Course Syllabus: ( Posted on Blackboard)
2. Text:
  - a. SOA Exam P Sample Problems.  
(Questions) <https://www.soa.org/globalassets/assets/Files/Edu/edu-exam-p-sample-quest.pdf>  
(Solutions) <https://www.soa.org/globalassets/assets/Files/Edu/edu-exam-p-sample-sol.pdf>
  - b. Broverman, S.A., ACTEX P/1 Study Manual, 2018 edition, ACTEX Publications Inc.
3. Class Notes: ( In class & Black Board notes)
4. Calculator: Texas BA II Plus Calculator or Texas BAI Professional

**Supplemental Course Material:**

1. September, 2019 Exam P Syllabus as given by SOA.  
<https://www.soa.org/globalassets/assets/files/edu/2019/2019-09-exam-p-syllabus.pdf>
2. Tables for Exam P:  
<https://www.soa.org/globalassets/assets/files/edu/P-05-05tables.pdf>
3. SOA Risk & Insurance note:  
<http://www.soa.org/files/pdf/P-21-05.pdf>

**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 <b>Date: October 6<sup>th</sup> 2019, Time: TBA &amp; Location: TBA</b>	100 points (25%)
Exam 2 <b>Date: November 10<sup>th</sup> 2019 Time: TBA &amp; Location TBA</b>	100 points (25%)
Class Work <b>In class</b>	60 points (15%)
Final Exam (Comprehensive) <b>Final Exam Date: December 19<sup>th</sup> 2019 , Time: 8 AM</b>	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/globalassets/assets/files/edu/2019/2019-09-exam-p-syllabus.pdf>

## Academic Integrity:

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

Week	Date	Topic	Important Dates
1	Sep 1 <sup>st</sup> – Sep 5 <sup>th</sup>	<b>Chapter 1:</b> Basic Probability Concepts. Probability Spaces and Events, Probability.	
2	Sep 8 <sup>st</sup> – Sep 12 <sup>th</sup>	<b>Chapter 2:</b> Conditional Probability and Independence. Definition of Conditional Probability, Bayes' Theorem and the Law of Total Probability.	
3	Sep 15 <sup>st</sup> – Sep 19 <sup>th</sup>	<b>Chapter 3:</b> Combinatorial Principles. Permutations and Combinations	
4	Sep 22 <sup>nd</sup> – Sep 26 <sup>th</sup>	<b>Chapter 4:</b> Random variables and Probability Distribution. Discrete Random Variable, Continuous Random Variable, Mixed Distribution, Cumulative Distribution Function, Independent Random Variables.	Sep 23 <sup>rd</sup> : <b>National Holiday</b>
5	Sep 29 <sup>nd</sup> – Oct 3 <sup>rd</sup>	<b>Chapter 5:</b> Expectation and Other Distribution Parameters. Expected Value, Moments of a Random Variable, Variance and Standard Deviation, Moment Generating Function, Percentiles, Median, and Mode	
6	Oct 6 <sup>th</sup> – Oct 10 <sup>th</sup>	<b>Chapter 6:</b> Frequently Used Discrete Distributions. Discrete Uniform Distribution, Binomial Distribution, Poisson Distribution, Geometric Distribution, Negative Binomial Distribution, Hypergeometric Distribution, Multinomial Distribution, Summary of Discrete Distributions.	<b>October 6<sup>th</sup>: First Major Exam.</b>
7	Oct 13 <sup>th</sup> – Oct 17 <sup>th</sup>	<b>Chapter 6:</b> Continued	
8	Oct 20 <sup>th</sup> – Oct 24 <sup>th</sup>	<b>Chapter 7:</b> Frequently Used Continuous Distributions. Continuous Uniform Distribution, Normal Distribution, Approximating a Distribution Using a Normal Distribution, Exponential Distribution, Gamma Distribution, Summary of Continuous Distributions	
9	Oct 27 <sup>th</sup> – Oct 31 <sup>st</sup>	<b>Chapter 7:</b> Continued	
10	Nov 3 <sup>rd</sup> – Nov 7 <sup>th</sup>	<b>Chapter 8:</b> Joint, Marginal, and Conditional Distributions. Definition of Joint Distribution, Expectation of a Function of Jointly Distributed Random Variables, Marginal Distributions, Independence of Random Variables, Conditional Distributions, Covariance and Correlation Between Random Variables, Moment Generating Function for a Joint Distribution, Bivariate Normal Distribution	
11	Nov 10 <sup>th</sup> – Nov 14 <sup>th</sup>	<b>Chapter 8:</b> Continued	<b>November 10<sup>th</sup> : Second Major Exam</b>
12	Nov 17 <sup>th</sup> – Nov 21 <sup>st</sup>	<b>Chapter 9:</b> Transformation of Random Variables. Distribution of a Transformation of X, Distribution of a Transformation of Joint Distribution of X and Y, Distribution of a Sum of Random Variables, Distribution of the Maximum or Minimum of Independent RV $\{X_1, X_2, \dots, X_n\}$ , Order Statistics, Mixtures of Distributions	
13	Nov 24 <sup>th</sup> – Nov 28 <sup>th</sup>	<b>Chapter 9:</b> Continued	
14	Dec 1 <sup>st</sup> – Dec 5 <sup>th</sup>	<b>Chapter 10:</b> Risk Management Concepts. Loss Distributions and Insurance, Insurance Policy Deductible, Insurance Policy Limit, Proportional Insurance	
15	Dec 8 <sup>th</sup> – Dec 15 <sup>th</sup>	Review	
<b>Final Examination</b> Date: <b>December 19<sup>th</sup> 2019</b> , Time: <b>8 AM</b> , Location: <b>TBA</b>			