King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

STAT213: STATISTICAL METHODS for ACTUARIES
Fall Semester (Term 131)

Instructor: Dr. Walid S. Al-Sabah

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Office Hours: Sunday & Tuesday   10:00 – 10:45 am
                    Monday   10:00 am – 1:00 pm

Check Blackboard regularly for announcements

Course Objectives:
Introduce basic concepts of statistics methods to actuary students. Emphasize the understanding of the nature of randomness of real world problems, the formulation and analysis of real world problems using well known statistical methods to make meaningful decisions.

Learning Objectives: By completing this course, students should be able to
 ➢ Distinguish between a sample and a population
 ➢ Distinguish between a statistic and a parameter
 ➢ Design a business data collection effort by using the most appropriate data sampling strategy
 ➢ Classify business data into the most appropriate type and measurement levels
 ➢ Distinguish between continuous and discrete data
 ➢ Calculate summary descriptive statistics manually and by MINITAB
 ➢ Interpret the correct meaning of summary statistics for particular real-life business problems
 ➢ Graph a correct graphical display for the correct type of data manually and by MINITAB
 ➢ Calculate the probability for different types of events (marginal, conditional, and joint events) and for updated posterior events
 ➢ Calculate expected values of future events
 ➢ Recognize and use the correct probability distribution model for a particular application manually and by MINITAB
 ➢ Distinguish between continuous and discrete probability distribution models
 ➢ Distinguish between distribution for sample data, distribution for population data, and distribution for sample statistics
 ➢ Understand the role of central limit theorem in the distribution of sample statistics
 ➢ Evaluate the correctness and error levels of a procedure for estimating a population parameter
 ➢ Estimate parameters of a business population of interest manually and by MINITAB
 ➢ Formulate and test a hypothesis test about the mean of a normal distribution
 ➢ Formulate and test a hypothesis about a population proportion
 ➢ Formulate and test a hypothesis about the difference between two normal population means
 ➢ Formulate and test a hypothesis about the difference between two population proportions
 ➢ Formulate and test a hypothesis about a population variance
 ➢ Formulate and test a hypothesis about the ration of two population variances
 ➢ Interpret the results of hypothesis tests and explain the result in context
 ➢ Formulate a linear regression problem and interpret the estimated coefficients
 ➢ Formulate and test hypotheses about the coefficients of a linear regression problem
 ➢ Check the assumptions of a linear regression problem
 ➢ Build and interpret autoregressive time series models
 ➢ Choose an appropriate forecasting model
 ➢ Understand and interpret index numbers

Textbook and Package:
1. Basic Business Statistics: Concepts and Applications, 11th edition, by Berenson, M.L., Levine, D.M., and Krehbiel, T.C., Pearson-Prentice Hall (2009).
2. **MINITAB** (http://www.minitab.com/products/minitab/student/)
3. **Scientific calculator with statistical functions**

Assessment
Assessment for this course will be based on quizzes, homework, lab, two major exams and a comprehensive final exam, as in the following:

Activity	Weight
Homework	5%
Lab	15%
Exam 1: (Chapters 1, 2, 3 & 4) ***Thursday October 3 , 2013***	15%
Exam 2: (Chapters 5, 6, 7 & 8) ***Thursday November 7, 2013***	15%
Exam 3: (Chapters 9 & 10) ***Thursday November 28, 2013***	15%
Final Exam (Comprehensive)	35%

Grade Assignment

Score	87 – 100	80 – 86	75 – 79	70 – 74	65 – 69	60 – 64	55 – 59	50 – 54
Grade	A+	A	B+	B	C+	C	D+	D

Academic Integrity: All KFUPM policies regarding **ethics** and **academic honesty** apply to this course.
Important Notes:
✓ Please bring your book to every class, as well as a calculator with statistical functions.
✓ Excessive unexcused absences will result in a grade of ***DN*** in accordance with University rules.
✓ ***Attendance*** on time is ***very*** important.
✓ ***A formula sheet*** and ***statistical tables*** **will be given for you in every exam, so you only need to bring with you *pens*, *pencils*, *a sharpener*, *an eraser*, and a *calculator*.**
Home Work:
✓ To successfully learn statistics, students need to solve problems and analyze data. The selected assigned problems are specifically designed to help you understand the material.
✓ Homework is due in class on the first Sunday after completing a chapter.
✓ No late homework will be accepted.

<div align="center">**Syllabus**</div>

WEEK	*Sections*	Topics	Reminders
Week 1 September 1 - 5	1.1 – 1.6 2.1– 2.5	Introduction and Data Collection Presenting data in tables and charts	
Week 2 September 8 - 12	3.1 – 3.3	Numerical descriptive measures	Thursday September 12 Last day for dropping course(s) without permanent record
Week 3 September 15 - 19	3.4 – 3.6	Numerical descriptive measures Continued	
Week 4 September 22 - 26	4.1 – 4.3 5.1	Basic probability The probability distribution for a discrete random variable	
Week 5 September 28 - October 3	5.3. – 5.5 6.1 – 6.2	Binomial, Poisson and Hypergeometric distributions The normal distribution	
Week 6 October 6 - 9	6.3 – 6.6 7.1 – 7.2	Other distributions Sampling methods	
<td colspan="4" align="center">**Hajj Vacation**</td>
Week 7 October 21 - 24	7.3 – 7.5	Sampling distributions	Monday October 21 Last day for dropping course(s) with grade of "W" thru Internet http://regweb.kfupm.edu.sa
Week 8 October 27 - 31	8.1 – 8.4	Confidence interval estimation	
Week 9 November 3 - 7	9.1 – 9.4	One sample hypothesis testing	
Week 10 November 10 - 14	10.1 – 10.3	Two- sample hypothesis testing	Thursday November 14 Last day for withdrawal from all courses with grade of "W" thru the Univ Registrar Office
Week 11 November 17 - 21	10.4 12.1 – 12.3 12.5	F test for difference between two variances Chi-Square tests, except Marascuilo Procedure	Sunday November 17 Beginning of Early Registration for the Second Semester, 2013-2014 (132); Beginning of registration for Coop
Week 12 November 24 - 28	13.1 – 13.4	Simple linear regression	
Week 13 December 1 – 5	13.7 – 13.8 14.1 – 14.2	Simple linear regression Continued Introduction to multiple regression	
Week 14 December 8 – 12	14.4	Introduction to multiple regression Continued	
Week 15 December 15 – 19	16.1 – 16.3	Time-series and index numbers	
December 22 – 24	16.4: Only the Linear Trend Model & 16.8	Cont. Time-series and index numbers	