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

STAT319: Probability and Statistics for Engineers and Scientists
Fall Semester (Term 131)

Course Objectives: Introduce the basic concepts of probability and statistics to engineering students. Emphasis will be given on the understanding of the nature of randomness of real world phenomena; the formulation of statistical methods by using intuitive arguments, solving them and thereby making meaningful decisions.

***Learning Outcomes**:* By completing this course, students should acquire/learn

- A thorough understanding of descriptive statistics, both graphical and numerical
- A working knowledge of sample spaces, events, and operations on events
- Elementary probability concepts
- A good understanding of random variables and their means and variances
- Basic discrete and continuous random variables
- The concept of a sampling distribution, and the central limit theorem
- Point and interval estimation of means and proportions
- Basic concepts of hypothesis testing including the hypothesis testing setup, procedure, p-values
- Correlation
- Simple linear regression, including estimation and testing of model parameters
- Basic Concepts of multiple linear regression

Text: Applied Statistics and Probability for Engineers by D. Montgomery and G. Runger, 5th Edition, Wiley, 2011.

Software Package: The Student Edition of ***STATISTICA*** with a Lab Manual. A Lab syllabus is available with your lab instructor.

Assessment*

Activity	Weight
Class work	5%
Lab Work (see Lab syllabus)	20%
First Major Exam (Chapters 2 and 3) Monday September 30, 2013, 6:00 pm	10%
Second Major Exam (Chapters 4, 7 + Descriptive Statistics from Lab) Monday October 28, 2013,5:30 pm	15%
Third Major Exam (Chapters 8, 9 and 10) Monday December 9, 2013,5:15 pm	15%
Final Exam (Comprehensive) Time and Location TBA	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.

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.

Schedule

WEEK	Topic	Reminders
Week 1 September 1 - 5	**Ch 2: Probability** 2.1 Sample Space and Events 2.2 Axioms of Probability 2.3 Addition Rule 2.4 Conditional Probability	
Week 2 September 8 - 12	2.5 Multiplication Rule 2.6 Independence 2.7 Bayes' Theorem **Ch 3: Discrete Probability Distributions** 3.1 Discrete Random variables 3.2 Probability Mass Functions 3.3 Cumulative Distribution Functions	Thursday September 12 Last day for dropping course(s) without permanent record
Week 3 September 15 - 19	3.4 Mean and Variance 3.5 Discrete Uniform Distribution 3.6 Binomial Distribution 3.7 Geometric Distribution	
Week 4 September 22 - 26	3.8 Hypergeometric Distribution 3.9 Poisson Distribution **Ch 4: Continuous Probability Distributions** 4.1 Continuous Random Variables 4.2 Probability Density Functions 4.3 Cumulative Distribution Functions	
Week 5 September 29 - October 3	4.4 Mean and Variance 4.5 Continuous Uniform Distribution 4.6 The Normal Distribution 4.7 Normal Approximation to the Binomial and Poisson Distributions	
Week 6 October 6 – 9	4.8 Exponential Distribution **Ch 7: Sampling Distributions** 7.1 Point Estimation	
Hajj Vacation		
Week 7 October 21 - 24	7.2 Sampling Distributions and the Central Limit Theorem	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	**Ch 8: Statistical Intervals for a Single Sample** 8.1 Confidence Interval for the Mean of a Normal Distribution with Known Variance 8.2 Confidence Interval for the Mean of a Normal Distribution with Unknown Variance	
	8.4 Large Sample Confidence Interval for a	

Week 9 November 3 - 7	Population Proportion **Ch 10: Statistical Inference for Two Samples** 10-1.3 Intervals on the Difference in Means of Two Normal Distributions with Known Variances	
Week 10 November 10 - 14	10-2.3 Intervals on the Difference in Means of Two Normal Distributions with Unknown Variances 10-6.3 Large Sample Intervals on the Difference in Population Proportions	Thursday November 14 Last day for withdrawal from all courses with grade of "W" thru the Univ Registrar Office
Week 11 November 17 - 21	**Ch 9: Tests of Hypotheses for a Single Sample** 9.1 Hypothesis Testing 9.2.1 Tests on the Mean of a Normal Distribution with Known Variance 9.3.1 Tests on the Mean of a Normal Distribution with Unknown Variance	Sunday November 17 Beginning of Early Registration for the Second Semester, 2013-2014 (132); Beginning of registration for Coop
Week 12 November 24 - 28	9.5.1 Tests on a Population Proportion **Ch 10: Statistical Inference for Two Samples Continued** 10-1.1 Tests on the Difference in Means of Two Normal Distributions with Known Variances 10-2.1 Tests on the Difference in Means of Two Normal Distributions with Unknown Variances	
Week 13 December 1 – 5	10.4 Paired t-test 10-6.1 Large Sample Tests on the Difference in Population Proportions	
Week 14 December 8 – 12	**Ch 11: Simple Linear Regression and Correlation** 11.2 Simple Linear Regression 11.4 Hypothesis Tests in SLR	Thursday December 12 Last day for withdrawal from all courses with grade of "WP/WF" thru the University Registrar Office
Week 15 December 15 – 19	11.5 Confidence Intervals 11.6 Prediction of New Observations	
December 22 – 24	11.8 Correlation	Tuesday December 24 Normal Thursday Classes