

**KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPT OF MATHEMATICAL SCIENCES, DHAHRAN, SAUDI ARABIA**

**STAT319: PROBABILITY & STATISTICS FOR ENGINEERS & SCIENTISTS
Course Syllabus, Summer 2005 (Term 053)**

Instructor: Walid Abu-Dayyeh, **Office:** 6-137, **Phone:** 860 3497

Email: dayyeh@kfupm.edu.sa

Office Hours: 10:30- 11:30 noon (Sat - Wed) or by appointment

Text : Probability & Statistics for Engineers and Scientists by Walpole et.al. (2002) 7th ed.

Software Package: The Student Edition of **STATISTICA** with a **Lab Manual**.

Course Objectives: Introducing 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 and thereby making meaningful decisions.

Assessment: Assessment for this course will be based on the Class Participation (attendance, asking questions and comments), home works, class tests, two major exams, a 'comprehensive' final exam and lab works, as in the following:

Activity	Weight
class works, home works and others	6%
Exam 1 (Chapters 1, 2) Saturday 8/07/ 2006	13%
Exam 2 (Chapters 3, 4, 5 and 6) Saturday 22/07/ 2006	13%
Exam 3 (Chapters:8,9,10) Saturday 6/08/ 2006	13%
Lab Quizzes and Lab Work	15%
Final Exam (Comprehensive)	40%

Students will be required to carry a calculator with statistical functions.

Syllabus

		Topic	Section
01	June 24 – June 28	Descriptive Statistics: Frequency distribution, histogram, stem and leaf, mean, median and mode, percentiles, quartiles, IQR, box plot, range, variance, standard deviation and empirical rule, CV and CSk.	An instructor can depend on the lab manual or other material for clarity of some concepts. 1.1, 1.4, 1.5, 1.8
02	July 1 – July 5	Probability: Sample Space, Events , Probability of an Event , Additive Rules , Conditional Probability , Multiplicative Rules	2.1, 2.2, 2.4-7
03	July 8 – July 12	Bayes' Rule Random Variables and Probability Distributions : Concept of a Random Variable, Discrete Probability Distributions , Continuous Probability Distributions Mathematical Expectation: Mean of a Single Random Variable (including up to Example 4.5), Variance (including up to Example 4.12), Means of linear Combinations (including up to Example 4.18)	2.8 3.1-3.3 4.1-4.3
04	July 15 – July 19	Discrete Probability Distributions : Binomial Distribution, Hypergeometric Distribution , Geometric Distribution , Poisson Distribution . Continuous Probability Distributions: Continuous Uniform Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, 5 Normal Approximation to the Binomial Distribution, Exponential Distributions, Application of Exponential Distribution, Chi-squared Distribution	5.3-5.6 6.1-6.7
05	July 22 – July 26	Sampling Distributions : Random Sampling, Some Important Statistics, Sampling Distributions, Sampling Distribution of Means, Sampling Distribution of Sample Variance, t-Distribution Estimation Problems: Estimating the Mean, Standard Error of a Point Estimate, Two Sample Pooled T-Interval , Estimating a Proportion	8.1, 8.2, 8.4-8.7 9.1-9.3, 9.4-9.5, 9.8, 9.10-9.11
06	July 29 – Aug 2	Tests of Hypotheses: Statistical Hypotheses, Testing a Statistical Hypothesis, One and Two Tailed Tests, The Use of p-Values for Decision Making, Tests Concerning a Single Mean, Relationship to Confidence Interval	10.1-10.8, 10.11
07	Aug 5 – Aug 9	Tests on a Single Mean (Variance Unknown), Two Sample test (Equal variance case only), Test on a Single Proportion Linear regression: The Simple Linear Regression Model, Correlation, Properties of the Least Squares Estimators	11.2-11.3, 11.5-11.4
08	Aug 12 – Aug 10	Inferences Concerning the Regression Coefficients, Prediction	11.5-11.6

Suggested Problems

Chapter Two: 2.2 (29-31): 4, 8, 15; **2.4-2.5 (46-47):** 1, 3, 8, 15, 17; **2.6-2.7(54-56):** 5, 8, 16, 17; **2.8 (60-61):** 2, 8

Chapter Three: 3.1-3.3 (72-74): 5, 7, 9, and 13

Chapter Four: 4.1 (94-95): 5, 13, 14, 17, 4.2-4.3 (112): 3, 5, 6

Chapter Five: 5.3 (124-126): 5, 9, 16, 27, 28, 5.4 (131-132): 4, 8, 20, 5.5-5.6 (139-140): 7, 8, 19, 21.

Chapter Six: 6.1-6.4 (156-158): 9, 13, 15, 17; 6.5 (164-165): 4, 13, 6.6 - 6.8 (174-175): 7, 8, 15, Rev #2

Chapter Eight: 8.5(215-216): 3, 7, and 9.

Chapter Nine: 9.4-9.6 (245-246): 4, 8, and 13; 9.8 (255-256): 4, 6, 8; 9.10-9.11 ((262-264): 3, 10, 16;

Chapter Ten: 10.3-10.4: (298-299): 15; 10.5-10.7: (319-323): 1, 2, 7; 10.8: 10, 15, 18
10.11 (328): 7, 9

Chapter Eleven: 11.12 396): 4, 11.3 (358-360): 1, 3, 4, 7, 11.4-11.6 (371-372): 3, 5, 6, 11

Students are required to carry a Scientific calculator with stat functions to every lecture, lab and in the exam. Students are also required to keep the prescribed Formula Sheet with them.

Remark: Once a chapter is finished, the hw of that chapter should be submitted after three lectures after that.