

**KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPT OF MATHEMATICS & STATISTICS**

**STAT319: PROBABILITY & STATISTICS FOR ENGINEERS & SCIENTISTS
Summer 2010 (Term 093)**

Instructor: Musawar A. Malik **Office:** 5-306 **Phone:** 2396
Email: mmalik@kfupm.edu.sa
Office Hours: SMW: 09:15 – 10:30 am., SMW: 11:30 – 12:00 pm, or by Appointment.

Text: Miller & Freund's Probability and Statistics for Engineers by Johnson, R. A. (2005) 7th Ed.

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

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 and thereby making meaningful decisions.

Assessment:

Activity	Weight
<i>Home Work, Quizzes, Projects, Class Works, Attendance</i>	15%
<i>Lab Work</i>	15%
<i>First Major Exam (Chapters 1 to 3) Saturday, July 24, Building 5. Time 6:30 – 8:30.</i>	15%
<i>Second Major Exam (Chapters 4 to 6) Saturday, August 7, Building 5. Time 6:30 – 8:30.</i>	15%
<i>Final Exam (Comprehensive) TBA</i>	40%

Students are required to carry a Scientific calculator with **stat functions** to every lecture, lab and in the exam with them. Usually once a chapter is finished, you expect a class test.

Homework

Chapter 2

2.9, 2.16, 2.39, 2.40, 2.63, 2.64, 2.68, 2.69.

Chapter 3

3.5, 3.12, 3.26, 3.29, 3.34, 3.35, 3.41, 3.48, 3.62, 3.63, 3.89.

Chapter 4

4.4, 4.10, 4.11, 4.26, 4.37, 4.54, 4.59, 4.62, 4.82, 4.86, 4.88.

Chapter 5

5.4, 5.11, 5.14, 5.20, 5.21, 5.24, 5.36, 5.46, 5.58, 5.108, 5.113.

Chapter 6

6.5, 6.6, 6.20, 6.34, 6.40

Chapter 7

7.9, 7.11, 7.24, 7.32, 7.33, 7.44, 7.48, 7.64, 7.68, 7.94

Chapter 9

9.6, 9.10, 9.20, 9.22, 9.53, 9.54

Chapter 11

11.4, 11.14, 11.15, 11.50, 11.51.

Syllabus

Week	Topic
Week 1 03/7- 07/7	Ch 1. Introduction Ch 2. Treatment of Data 2.1 Pareto Diagrams and Dot Diagrams 2.2 Frequency Distributions 2.3 Graphs of frequency distributions 2.4 Stem-and-leaf displays 2.5 Descriptive measures 2.7 The calculation of mean and variance
Week 2 10/7 – 14/7	Ch 2. Treatment of Data 2.6 Quartiles and percentiles Ch 3. Probability 3.1 - 3.2 Sample space and events and Counting 3.3 Probability 3.4 The Axioms of probability 3.5 Some elementary theorems 3.6 Conditional probability
Week 3 17/7 - 21/7	Ch 3. Probability 3.7 Bayes' Theorem 3.8 Mathematical expectation Ch 4. Probability Distributions 4.1 Random variables 4.2 - 4.3 Binomial and hypergeometric distributions
Week 4 24/7 - 28/7	Ch 4. Probability Distributions 4.4 The mean and the variance of the distributions 4.7 – 4.8 Poisson and geometric distributions. Ch 5. Probability Densities 5.1 Continuous random variables 5.2 The normal distribution 5.3 The normal approximation to the binomial 5.4 – 5.9 Other probability distributions
Week 5 31/7 - 4/8	Ch 6. Sampling distributions 6.1 Populations and samples 6.2 – 6.3 Sampling distribution of the mean 6.3 Sampling distribution of variance Ch 7. Inferences Concerning Means 7.1 – 7.2 Point and interval estimation concerning mean 7.3 Testing hypotheses concerning mean
Week 6 7/8 - 11/8	Ch 7. Inferences Concerning Means 7.3 - 7.5 Testing hypotheses concerning mean 7.6 Relation between testing hypotheses and confidence intervals 7.8 Inference concerning two population means Ch 9. Inferences Concerning Proportions 9.1 -9.2 Estimation and hypotheses concerning one proportion
Week 7 14/8 - 18/8	Ch 11. Curve Fitting 11.1 The method of least square 11.2 Inference based on least square estimators 11.2 Inference based on least square estimators 11.6 Correlation
Week 8 21/8 - 23/8	Review

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DEPT OF MATHEMATICAL SCIENCES, DHAHRAN, SAUDI ARABIA

STAT319: PROBABILITY & STATISTICS FOR ENGINEERS & SCIENTISTS
Course Syllabus, Summer 2009 (Term 093)

Instructor: Hassen A Muttlak, **Office:** 5-407, **Phone:** 860 3974

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Office Hours: 11.3am -1.0pm SUMT 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 homework, class work, 4 major exams, a final exam and lab works, as in the following:

Activity	Weight
<i>Home Works and class work</i>	15%
<i>Lab Works</i>	15%
<i>Three short Major Exams the end of each two weeks</i>	30%
<i>Final Exam Comprehensive</i>	40%

Students are required to carry a Scientific calculator with **stat functions** to every lecture, lab and in the exam.

Home Work:

2.2 (pp. 29-31): 4,8,15; **2.4-2.5 (pp.46-47):** 1,3,8,15,17; **2.6-2.7(pp. 54-56):** 3,5,8,16,17;

2.8 (60-61): 2, 8

3.1-3.3 (pp. 72-74): 5, 7, 9, 13

4.1 (pp. 94-95): 5,13,14,17; **4.2-4.3 (pp.112):** 3, 5, 6

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

6.1-6.4 (pp. 156-158): 9,13,15, 17; **6.5 (pp. 164-165):** 4,13; **6.6 – 6.8 (pp. 174-175):** 7,8,15

8.5(pp. 215-216): 3,7,9

9.4-9.6 (pp. 245-246): 4, 8, 13; **9.8 (pp. 255-256):** 4,6,8; **9.10-9.11 (pp. 262-264):** 3, 10, 16; **9.12 (pp. 68):** 1

10.3-10.4: (pp. 298-299): 15; **10.5-10.7: (pp. 319-323):** 1, 2, 7; **10.11 (pp.328):** 7, 9

11.12 (pp. 396): 4; **11.3 (pp. 358-360):** 1, 3, 4, 7; **11.4-11.6 (pp. 371-372):** 3, 5, 6, 11

Week	Topic
(1)	Ch. 1. Descriptive Statistics: 1.1 – 1.8
	Overview: population and sample
	Graphical Methods and Data Description: stem and leaf, and histogram
	Measures of Location: mean median, mode and Percentiles
	Measures of Variability: variance, standard deviation
(2)	Box plot, Empirical Rule, z-scores, C.V. and C.S.
	Ch 2. Probability: 2.1 – 2.8
	Sample Space, Events, Probability of an Event, Additive Rules
	Conditional Probability, Multiplicative Rules
	Bayes' Rule and Independence
(3)	Ch 3. Random Variables and Probability Distributions: 3.1- 3.3
	Concept of a Random Variable , Discrete Probability Distributions
	Continuous Probability Distributions
	Ch 4. Mathematical Expectation: 4.1 – 4.3
	Mean and variance of a Single Random Variable
	Means of linear Combinations
	Ch 5. Discrete Probability Distributions: 5.1- 5.6
(4)	Binomial, Hypergeometric, Geometric and Poisson Distributions
	Ch 6. Continuous Probability Distributions: 6.1 – 6.10
	Continuous Uniform and Normal Distributions
	Areas under the Normal Curve and Applications of the Normal Distribution
	Normal Approximation to the Binomial Distribution
	Exponential Distribution and other Distributions
(5)	Ch 8. Sampling Distributions: 8.1-8.7
	Random Sampling and Some Important Statistics
	Sampling Distributions and Sampling Distribution of Means
	Sampling Distribution of Sample Variance and t -Distribution
	Ch 9. Estimation Problems: 9.1-9.5; 9.8-9.12
	Estimating the Mean and Standard Error of a Point Estimate and confidence interval for single mean
(6)	Two Sample Pooled T-Interval
	Estimating a Proportion and Estimating the Difference Between Two Proportions
	Ch 10. Tests of Hypothesis: 10.1 – 10.9 and 10.11
	Statistical Hypotheses, Testing a Statistical Hypothesis and One and Two Tailed Tests
	The Use of p-Values for Decision Making
(7)	Tests Concerning a Single Mean
	Relationship to Confidence and testing hypothesis
	Tests on a Single Mean (Variance Unknown) and Test on a Single Proportion
	Ch 11. Simple Linear Regression: 11.1- 11.6 and 11.12
(8)	The Simple Linear Regression Model, Least Squares and the Fitted Model
	Properties of the Least Squares Estimators, Correlation
	Inferences Concerning the Regression Coefficients and prediction.