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

STAT319: Probability and Statistics for Engineers and Scientists
Spring Semester (Term 122)

Coordinators: Walid Sharabati and Raid Anabosi

STAT319.06 SMW 11:00 - 11:50 am

Instructor: Dr. Walid S. Al-Sabah

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Office Hours: Monday 9:15 – 10:45 am
Tuesday 10:00 am – 1:00 pm

Check Blackboard regularly for announcements

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
- 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: Homework and Quizzes[1]	*15%*
Lab Work (see Lab syllabus)	*20%*
First Major Exam (Chapters 2, 3 and 4): Monday, March 4, 2013 at 6:00pm – Building 10 (Auditorium)	*15%*
Second Major Exam (Chapters 6, 7 and 8): Monday, April 15, 2013 at 6:00pm – Building 10 (Auditorium)	*15%*
Final Exam (Comprehensive): 7:00pm, Saturday, May 18, 2013	*35%*

***You need to achieve at least 50% in order to pass the course**

[1] Expect a quiz at the end of each chapter.

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 Saturday after completing a chapter.
- ✓ No late homework will be accepted.

Schedule

WEEK	Topic	Reminders
Week 1 Jan. 26-30	**Ch 2: Probability** 2.1 Sample Space and Events 2.2 Axioms of Probability 2.3 Addition Rule 2.4 Conditional Probability	January 29: Last day for late registration; Last day for adding courses.
Week 2 Feb. 2-6	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	February 6: Last day for dropping course(s) without record
Week 3 Feb. 9-13	3.4 Mean and Variance 3.5 Discrete Uniform Distribution 3.6 Binomial Distribution 3.7 Geometric Distribution	
Week 4 Feb. 16-20	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 Feb. 23-27	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 Mar. 2-6	4.8 Exponential Distribution **Ch 7: Sampling Distributions** 7.1 Point Estimation	March 2nd: Midterm Grade Reports due in the Deanship **Major Exam 1: Monday, March 4th** March 6: Last day for Dropping **courses** with "W" online
Week 7 Mar. 9-13	7.2 Sampling Distributions and the Central Limit Theorem **Ch 8: Statistical Intervals for a Single Sample** 8.1 Confidence Interval for the Mean of a Normal Distribution with Known Variance	

Week 8 Mar. 16-20	8.2 Confidence Interval for the Mean of a Normal Distribution with Unknown Variance 8.4 Large Sample Confidence Interval for a Population Proportion	
Midterm Vacation: Thursday, March 21, 2013 to Friday, March 29, 2013		
Week 9 Mar. 30 - Apr. 3	**Ch 9: Tests of Hypotheses for a Single Sample** 9.1 Hypothesis Testing 9.2 Tests on the Mean of a Normal Distribution with Known Variance	
Week 10 Apr. 6-10	9.2 Tests on the Mean of a Normal Distribution with Known Variance 9.3 Tests on the Mean of a Normal Distribution with Unknown Variance	April 10: Last day for withdrawal from **all courses** with grade of "W" thru URO
Week 11 Apr. 13-17	9.5 Tests on a Population Proportion **Ch 10: Statistical Inference for Two Samples** 10.1 Inference on the Difference in Means of Two Normal Distributions with Known Variances 10.2 Inference on the Difference in Means of Two Normal Distributions with Unknown Variances	**Major Exam 2: Monday, April 15th**
Week 12 Apr. 20-24	10.4 Paired t-test 10.6 Inference on Two Population Proportions	
Week 13 Apr. 27 – May 1	**Ch 11: Simple Linear Regression and Correlation** 11.2 Simple Linear Regression 11.4 Hypothesis Tests in SLR	
Week 14 May 4-8	11.5 Confidence Intervals 11.6 Prediction of New Observations	May 8: Last day for withdrawal from all courses with grade of "WP/WF"
Week 15 May 11-15	11.8 Correlation Review	May 15: Last day of classes

May 18, 2013: Final Exam at 7:00pm
May 29, 2013: Last Day to Submit Final Grades