

**OPRE 6301**  
**Quantitative Introduction to Risk and Uncertainty in**  
**Business**  
**Project Management Program**  
**Fall 2007**

**Instructor:**

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**Office Hours:**

**MA 3.208 Mondays and Wednesdays 5:00 – 6:45**  
**Otherwise by Appointment**

**Student Learning Objectives/Outcomes:**

- 1) Be able to organize and summarize raw data**
- 2) Be able to build and evaluate a regression model from raw data**
- 3) Be able to apply the basic rules of Probability Theory**
- 4) Be able to apply the concept of a random variable to solve business problems**
- 5) Be able to apply the Normal, Poisson, and Binomial Distributions to solve Business Problems**
- 6) Be able to simulate data from the Normal, Poisson, and Binomial Distributions**
- 7) Be able to identify significant changes in averages and proportions**
- 8) Be able to determine if two populations have the same mean or the same proportion**
- 9) Be able to determine if several populations have the same mean**

**Text:**

**STATISTICS FOR MANAGEMENT AND ECONOMICS, 7<sup>th</sup> EDITION, by G. KELLER, DUXBURY PRESS, 2005.**

## **Grades:**

Course grade is based solely on three case studies (take-home examinations) given at the end of each module described below. There is no final exam. Each exam will be graded on the following scale:

- A 94 – 100
- B 87 – 93
- C 75 – 86

The final grade is the arithmetic average of the scores on the three exams.

Textbook practice problems for each section are suggested below. These are designed to help you understand the techniques and concepts introduced in the course and their completion does not count toward your grade.

## **Supplementary Materials:**

Lecture notes for the course and EXCEL files that will be used in the lectures can be downloaded from my web site [www.utdallas.edu/~wiorkow/](http://www.utdallas.edu/~wiorkow/)

## **Class Procedure:**

Each module corresponds to approximately 12 hours of class contact.

This course assumes that you are using a computer statistical package to implement the statistical procedures. All lectures use Microsoft EXCEL for illustrative purposes.

You are responsible for the material covered in the class sessions, a small portion of which is not covered in the text book. Conversely, you are not responsible for material in the text book not covered in the lectures.

## **Module 1 – Descriptive Statistics**

Textbook Chapters: Chapter 1; Appendix 1B  
Chapter 5  
Chapter 2  
Chapter 3  
Chapter 4 [Add "t" and "z"]  
Chapter 17; 17.1 – 17.7  
Chapter 18; 18.1 – 18.3

## Chapter 19

**Illustrative Problems:** 5.11, 5.12, 5.14, 5.15  
2.12, 2.14, 2.15, 2.20, 2.24a, 2.28.2.43, 2.44a, 2.46, 2.49, 2.53  
2.54, 2.64, 2.66, 2.68, 2.70, 2.72, 2.106  
3.9  
4.1, 4.2, 4.4, 4.6, 4.8, 4.10, 4.18, 4.32, 4.36, 4.60, 4.64, 4.68, 4.86  
17.6, 17.8, 17.16, 17.18, 17.98 (a,b,c), 17.104  
18.8, 18.10, 18.12, 18.40  
19.4, 19.8, 19.16, 19.22, 19.40, 19.48

## Module 2 – Probability and Random Variables

**Textbook Chapters:** Chapter 6 [Add Bayes Theorem; Basic Portfolio Analysis]  
Chapter 7 [Add Poisson Approximation to the Binomial]  
Chapter 8: 8.2 – 8.3 [Add Normal Approximation to the Poisson]  
[Add simulation of random variables using the computer]  
Chapter 23 [Add Risk Criteria; Decision Simulation]

**Illustrative Problems:** 6.8, 6.28, 6.36, 6.40, 6.42, 6.44, 6.56, 6.58, 6.62, 6.66, 6.70, 6.80  
6.96, 6.100  
7.20, 7.30, 7.32, 7.54, 7.68, 7.70, 7.72, 7.74, 7.76, 7.96, 7.98,  
7.104, 7.108, 7.112, 7.116, 7.118, 7.120, 7.122, 7.126, 7.130  
7.132, 7.136  
8.34, 8.36, 8.38, 8.40, 8.42, 8.54, 8.56, 8.64, 8.86, 8.88, 8.90  
8.94, 9.30, 9.32, 9.36, 9.38, 9.42 (Not a typo)  
23.10, 23.12, 23.14a, 23.16, 23.32 (a, b), 23.44

## Module 3 – Statistical Estimation and Inference

**Textbook Chapters:** Chapter 9  
Chapter 11: 11.1 – 11.3  
Chapter 10  
Chapter 12: 12.1, 12.3 – 12.5  
Chapter 13: 13.1 – 13.3  
Chapter 15: 15.1, 15.6  
Chapter 16: 16.1 – 16.3

**Illustrative Problems:** 9.22, 9.28, 9.30, 9.32, 9.36  
 11.10, 11.16, 11.44  
 10.26, 10.32, 10.36, 10.38, 10.52, 10.56  
 12.16, 12.22, 12.30, 12.34, 12.88, 12.92a, 12.122, 12.124  
 13.4, 13.18, 13.26, 13.46, 13.70, 13.88, 13.100  
 15.8, 15.10, 15.12, 15.16, 15.60, 15.70, 15.72, 15.74, 15.76  
 16.12, 16.14  
 (Note: The book uses an alpha value of .10. This is bad practice, use alpha = .05 or .01).

### Tentative Class Schedule

<u>Date</u>	<u>Activity</u>	<u>Exam Schedule</u>
Saturday, July 14 Morning	Begin Module 1	
Saturday, Aug 11 Morning	Continue Module 1	
Saturday, Sept 15 Morning	Finish Module 1	Exam 1 Distributed
Saturday, Oct 13 Morning	Begin Module 2	Exam 1 Due
Saturday, Nov 10 Afternoon	Continue Module 2	
Saturday, Dec 8 Morning	Finish Module 2	Exam 2 Distributed
Saturday, Jan 12 Morning	Begin Module 3	Exam 2 Due
Saturday, Jan 12 Afternoon	Continue Module	
Saturday, Feb 16 Morning	Finish Module 3	Exam 3 Distributed
		Exam 3 Due on Friday Of March Session