MSE 362 - ENGINEERING STATISTICAL APPLICATIONS

MW, 2:00-3:15 pm, Class Number 12060, Fall 2004

Instructor

Dr. Bonita Campbell, Professor of Engineering
Department of Manufacturing Systems Engineering and Management
Faculty Office: EA 1317; (818) 677-2484; bonita.campbell@csun.edu
MSEM Department Office: EA 1308; (818) 677-2167
Office Hour for MSE 362: MW 3:15-4:00 pm and by appointment

Course Text

Applied Statistics and Probability for Engineers, Third Edition, Douglas C. Montgomery and George C. Runger, John Wiley & Sons, Inc.

Course Notes

Selected course notes and related materials can be accessed via <www.csun.edu/~msem>
The course posting URL is <www.csun.edu/~bjc20362/Campbell-362.htm>

Catalog Description

Prerequisites: Math 250 and CE 240. Development and application of pertinent probabilistic and statistical techniques and methods for selected classes of engineering design and analysis problems. Applications to product and structural design, engineering experimentation, manufacturing processes and seismic analysis, and the reliability of structural and other engineering systems.

TOPIC OUTLINE PLAN

Week	Date	Topic	Chapter(s)	Due
1.	08/23	Intro, Statistics and Data	1, part of 6	
	08/25	Statistics and Data	1, part of 6	
2.	08/30	Probability	2	
	09/01	Probability	2	
3.	09/06	**Labor Day Holiday**		
	09/08	Distributions	3, 4	Quiz 1
4.	09/13	Distributions	3, 4	
	09/15	Distributions	3, 4	
5.	09/20	Distributions	3, 4, 5	
	09/22	Sampling and Estimation	6, 7	Quiz 2
6.	09/27	Catch Up / Review		
	09/29			Exam 1
7.	10/04	Estimation and Inference	8, 9, 10	
	10/06	Estimation and Inference	8, 9, 10	
8.	10/11	Estimation and Inference	8, 9, 10	Quiz 3
	10/13	Estimation and Inference	8, 9, 10	

9.	10/18	Estimation and Inference	8, 9, 10	
	10/20	Estimation and Inference	8, 9, 10	Quiz 4
10.	10/25	Catch Up / Review		
	10/27			Exam 2
11.	11/01	Regression/Correlation	11	
	11/03	Regression/Correlation	11	
12.	11/08	Experimental Design	notes, 13, 14	
	11/10	ANOVA	13	
13.	11/15	ANOVA	13	Quiz 5
	11/17	Reliability	notes	
14.	11/22	Reliability	notes	
	11/24	SPC	16	
15.	11/29	SPC	16	Quiz 6
	12/01	Catch Up / Review		
16.	12/06	MONDAY, 3:00 pm	**Note Start Time**	Exam 3

COURSE LEARNING OBJECTIVES

This course is designed to contribute primarily to your ability to:

- Select appropriate probability distributions and determine corresponding probabilities
- Select and apply appropriate statistics for hypothesis tests and confidence intervals for means, variances, and proportions
- Apply regression and correlation to the creation and assessment of simple empirical models
- Identify and describe selected factors affecting internal and external vailidity of experimental designs
- Describe potential misrepresentations and misinterpretations of statistical results
- Apply basic ANOVA models and interpret the results
- Determine the reliability of simple systems
- Develop variables controls for means and ranges and interpret the results
- Critique and correct individual work

EVALUATION

60 points - Three examinations, 20 points each, open book, open notes, no neighbors
25 points - Problem set Quizzes, best 5 of 6, 5 points each, open book, open notes, no neighbors
8 points - Class attendance and participation
7 points - Course portfolio [see instructions at end of syllabus]

Letter Grade Scale: A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: below 60
Plus/minus grading will ***not*** be used

?? Did you know ... ??
There is a direct correlation between hours spent studying and all academic outcomes
High expectations encourage high achievement

Suggestions from a Fall 2001 student:

> *"I would like to make a comment about the class material in general. Gaining an understanding of statistical methods is a building process. I found that preparing for the examinations had less to do with "cramming" the night before, and more to do with studying on a class-to-class basis. Many times I would briefly go over new material before it was taught in class. This way, new concepts weren't "over my head" so to speak; and I was able to get a lot more out of the lectures. When the time came to prepare for the exam, I felt I already had a strong grasp of the material."*

Learning Styles

Knowing your learning style will allow you to determine your best strategies for learning in this and other courses. A learning style questionnaire designed and validated for engineering students is available at
http://www.engr.ncsu.edu/learningstyles/ilsweb.html
You can complete and submit the questionnaire online, and receive your individual results immediately. The results page has a link to a document that provides suggested strategies for helping you to enhance your learning abilities. Your instructor's learning style is strongly Reflective, strongly Global, moderately Visual, and balanced between Sensing and Intuition.

STANDARD OPERATING PROCEDURES

- Class members are expected to maintain personal and professional standards consistent with The Fundamental Principles of the Code of Ethics of the Accreditation Board for Engineering and Technology, which are as follows:

  Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:
  - *using their knowledge and skill for the enhancement of human welfare;*
  - *being honest and impartial, and serving with fidelity the public, their employers and clients;*
  - *striving to increase the competence and prestige of the engineering profession; and*
  - *supporting the professional technical societies of their disciplines.*

- Class members will be considerate and respectful of their colleagues
- Class members are expected to attend class sessions and to be prompt
- Class members are responsible for material in reading assignments, class presentations, discussions, and problem assignments
- Portions of some chapters of the text will ***not*** be addressed; reading and study guide instructions are provided throughout the course
- Withdrawing from (dropping) this course should be accomplished during the first two weeks of instruction. Please note that failure to *officially* drop this class results in a grade of U, which is the equivalent of an F on your transcript and for your grade point average.
- It is a University requirement that all undergraduate students *must pass* the Writing Proficiency Examination (WPE) as part of earning their degree. Undergraduate students who have earned at least 56 semester units are eligible to take the WPE. Delaying the completion of the WPE

requirement can delay your graduation. See *www.csun.edu/~udwpe1* for complete information.

- The major of each student in this class will be verified using the University course roster. Students whose majors are not correct must submit a change of major within the first three weeks of the semester. The form required for undergraduate students is the *Major or Minor Change or Declaration*, and it can be obtained at *www.csun.edu/a&r/formslst2.htm*.
- Undergraduate students must apply to graduate *more than one year* in advance of graduation. Complete information about graduation, including deadlines for application, can be obtained at *www.csun.edu/~ariagesp/grad/*.

COURSE PORTFOLIO

Purposes Served by the Course Portfolio:

- Student reference and self-assessment tool
- Instructor course and evaluation methods assessment
- Undergraduate engineering programs curriculum assessment
- External undergraduate engineering programs accreditation review

Portfolio Format:

- All portfolios must be contained in an Oxford, ACCO, or equivalent pressboard binder with fasteners that securely hold portfolio materials.
- Portfolio contents and order are as listed below.
  1. Title Page, including name, student identification number, and email address
  2. Six Quizzes and Assessments of each; in chronological order.
     Each quiz must be accompanied by one or more pages that provide:
     a. A statement regarding the problem that was the most difficult for you and why it was the most difficult, and
     b. Complete and correct solutions for all of the problems on which you had errors.
  3. Exams (#1 and 2) and Assessments of each; in chronological order.
     Each exam must be accompanied by one or more pages that provide:
     a. A statement regarding the problem that was the most difficult for you and why it was the most difficult, and
     b. Complete and correct solutions for all of the problems on which you had errors.

Instructor Evaluation of Portfolios:

0-7 points, based on:

- Self-assessments of Problems Quizzes and Examinations (3 pts)
- Portfolio organization (1 pt)
- Portfolio completeness (2 pts)
- Timeliness of portfolio submission (1 pt)

Disposition of Portfolios:

- A selection of portfolios will be photocopied for program assessment records.
- Portfolios will be available for retrieval from the department office (EA 1308) two weeks after Exam #3 (i.e., Monday, 20 December 2004).
- Portfolios that have not been retrieved by the end of the fourth week of the Spring 2005 semester (i.e., Friday, 25 February 2005) will be destroyed.