NEW MEXICO STATE UNIVERSITY
DEPARTMENT OF HEALTH SCIENCE

HLS 451 Biometrics Health Research (3 HRS)
Spring 2008 Section M70 Online (Web CT) & Section M01 at HSS 318
MW: 4:30-5:45 PM

COURSE SYLLABUS

INSTRUCTOR: Mohammed Y Hussain, PhD
OFFICE: CHSS 335
PHONE: (575) 646-3379 & (575) 646-4300
E-MAIL: hussain@nmsu.edu
OFFICE HOURS: MW: 1:00-2:00 PM (other times are possible, please email and make appointment)
T: 1:00-2:00 PM (online chats)

GA Information: Greta Klinger (gklinger@nmsu.edu) CHSS 303B, (575) 646-4298, office hours: Monday & Wednesday 2:30-4:30pm and Tuesday & Thursday 1:00-2:15pm, or by appointment

COURSE DESCRIPTION

HLS 451 Biometrics Health Research deals primarily with quantitative/qualitative methods for Health Science students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression.

COURSE OBJECTIVES

At the conclusion of HLS451, you should be able to:

1. Compare and contrast appropriate statistical tool to use in your discipline, the type of variables being measured, the relevance of such variables to the understanding of the problems being addressed
2. Discuss in succinct terms what is the Health problem that has to be addressed, the leading environment in which it applies, and why it is necessary to study the problem in the first place
3. Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.
4. Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
5. Apply descriptive and inferential methodologies according to the type of study design for answering a particular research question.
6. Interpret results of statistical analyses found in all health related studies.
7. Develop written and oral presentations based on statistical analyses for both

public health professionals and educated lay audiences.

REQUIRED TEXT:

1. Basic Biostatistics: Statistics for Public Health Practice, B. Burt Gerstman
2. Supplementary notes and reviews will be posted

RECOMMENDED TEXTS: None

TENTATIVE COURSE OUTLINE:

This course will cover a wide spectrum of topics:

1. Introduction to Biometrics or Statistics in Biological applications
2. Basic Definitions, Populations & Samples, Frequency Distributions
3. Measures of Dispersion and Variability
4. Probability
5. Normal Distributions
6. One Sample Hypothesis Testing
7. Two Sample and Paired Sample Hypothesis Testing
8. Analysis of Variance and Correlation
9. Multiple Comparisons
10. Two-factor Analysis of Variance
11. Data Transformations
12. Simple Linear Regression and Correlation
13. Contingency Tables, Dichotomous Variables, Testing for Randomness

TENTATIVE SCHEDULE

Month/Day	Description of Activity
January	
16	**Introduction of biometrical data**
21	**Descriptive Statistics: Measures of Central tendency**
23	**Descriptive Statistics: Measures of Dispersion**
28	**Introduction to Probability**
30	**Binomial and Poisson distributions**
February	**Normal Probability distribution**
4	**Sampling with and without replacement**
6	**The Central Limit Theorem**
11	**Application on CLT**
13	**Examination #1: 4:30 PM-6:30 PM**
18	**Estimation and Confidence Intervals**
20	**Fitting a Normal distribution to Observed Data**
25	**Estimation and Hypothesis testing**

	27	More on simple hypothesis testing
March	3	Estimation and Confidence Intervals
	5	Inference about a mean
	10	Understanding statistical tables
	12	Comparing independent means
	17	Analysis of Variance (ANOVA): The concept
	19	Examination #2: 4:30-6:30 PM
	24	Comparing variances
	26	Analysis of Variance (ANOVA): Nesting
	31	Two-way (ANOVA) : SPSS&SAS applications
April	2	ANOVA Fundamentals and assumptions
	7	Linear Regression uses
	9	Linear Regression: Examination of Residuals
	14	Correlation
	16	Further assessment of correlation and reliability
	21	Non parametric tests of association
	23	Analysis of Proportions
	28	Single Classification Tests of Goodness of Fit
	30	Two-Way contingency tables
May	5	Review
	7	Final Examination

COURSE REQUIREMENTS:

Assignments
There will be weekly assignments with a specific due date. Assignments are usually emailed to you on a Friday by noon and will be due following Friday by noon. Any assignment submitted later than the due date will be subject to a 20% off for that day and will earn no points beyond that. Complete written solution to each assignment will be mailed to you a day after submission of your work.

Examinations
There will be three examinations during the semester. They are tentatively scheduled as follows:
Examination #1: February 13, 2008: 4:30-6:30 PM
Examination #2: March 19, 2008: 4:30-6:30 PM
Examination #3: May 7, 2008: 4:30-6:30 PM
Please mark your calendar now for these important dates.

Your grade is based on your work and efforts throughout the semester. It is assessed on weekly assignments and three examinations as follows:

1. Weekly assignments will average to 100 points
2. Three examinations (100 points each)

Final grade is the average of 400 points divided by 4.

A = 90 - 100 Points
B = 80 - 89 Points
C = 70 - 79 Points
D = 60 - 69 Points
F = <60 Points

ACADEMIC INTEGRITY

Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.

Any student accused of a specific act stated in the previous paragraph is subject to NMSU academic procedures relating or pertaining to violations of the student code of conduct for academic integrity.

ADA STATEMENT

The Americans with Disabilities Act (ADA) is a federal antidiscrimination statue that provides comprehensive civil protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Services for Students with Disabilities, Corbett Center, Room 244, 575.646.6840.

E-MAIL CONTACT

All communications associated with this course will be via your official NMSU e-mail account. Please be sure to check that account every week prior to class for important messages, handouts, etc.

CELL PHONES

Needless to say, cellular phone calls during class are disturbing to the learning environment. In that regard, I ask that all cell phones be turned off prior to the start of class. If you feel you need an exception to this request, please see me.