

COURSE OUTLINE

<u>MAT205</u>	<u>Statistics for Social & Health Sciences II</u>			<u>3</u>
Course Number	Course Title			Credits
<u>3/Week</u>	<u>0/Week</u>	<u>0/Week</u>	<u>0/Week</u>	<u>15 Weeks</u>
Class or Lecture	Laboratory Work Hours	Laboratory, Shop Studio or Clinic	Work Experience	Semester Length
<u>Not Applicable</u>				<u>Not Applicable</u>
Performance on An Examination/Demonstration				Telecourse

Required Materials:

Text: See Division Booklist

Catalog Description:

A second semester course in a year sequence for social sciences, humanities, nursing, and related fields. Topics include probability, inference for two parameters, inference for regression and correlation, Analysis of Variance, Analysis of Categorical data, and nonparametric statistics. Uses statistical software.

Latest Review: Spring 2006

Prerequisites: MAT200 and MAT146 with a minimum C grade or permission of instructor

Co-requisites: None

Course Coordinator: Leslie S. Grunes

Objective:

To give social science and nursing students the second semester course in a standard one-year elementary statistics course.

UNIT 1 - Probability

1. Sample space and events.
2. Probability of events
3. Find probability of
 - P (A or B) (Addition Rule)
 - P (not A) (Complement Rule)
 - P (B given A) (conditional probability)
4. Independent and dependent events.
5. Multiplication Rule

UNIT II - Inference

1. The student will know how to test for variances from two independent normal populations using the F-test.
2. The student will test the means of two independent populations using the z-test or t-test depending on the shape of the populations and the size of the samples.
3. The student will find the confidence interval of the difference of two means using either t - statistic or z-statistic.
4. The student will test hypothesis for two proportions sampled from two large independent populations using the z-test.
5. The student will confidence of difference of two proportions from large independent populations.

UNIT III Inference for Regression and correlation

1. Given a sample with two variables x, y , the student should be able to calculate the correlation coefficient .
2. The student should test the hypothesis $P = 0$ using the t-test.
3. The student should calculate the linear regression $y' = mx + b$ that is, find the calculated values of m and b using the least squares formula.
4. The student construct the confidence interval of y' by calculating least squares fit y using the t-statistics.

5. The student should calculate the coefficient of determination r^2 .
6. The student will know how to calculate the linear regression y in terms of two variables x_1, x_2 .

UNIT IV Chi-square and Analysis of Variance

Chi-Square

1. The student will use contingency table analysis testing hypotheses on equality of K proportions or the independence of two variables using the chi-square statistic

Analysis of Variance

1. The student will test the equality of K means from samples from K different populations of one factor using Analysis of Variance.
2. The student will test of the equality of means along with its interaction of two factors using the Analysis of Variance.

UNIT V - Nonparametric Statistics

1. The student will know the advantages and disadvantages of a nonparametric test.
2. The student will know the assumptions needed and the appropriate hypothesis to apply the following tests:
 - A. Sign Test
 - B. Wilcoxon Signed-Ranks Test for two Dependent Samples
 - C. Wilcoxon Rank-Sum Test for two Independent Samples
 - D. Kruskal - Wallis Test
 - E. Rank Correlation
 - F. Runs Test for Randomness

EVALUATION

An examination after each unit. Computer projects using MINITAB will be incorporated throughout the course.