

**Statistics 217 - Statistical Methods**

**March 2002**

**1. Catalog Description**

**Stat 217 Statistical Methods (4) GE B1**

Sampling and experimentation, descriptive statistics, confidence intervals, two-sample hypothesis tests for means and proportions, Chi-square tests, linear and multiple regression, analysis of variance. Not open to students with credit in STAT 212 or STAT 218 or STAT 221 or STAT 251. 4 lectures. Prerequisite: Intermediate algebra, appropriate score on ELM.

**2. Required Background and/or Experience**

Intermediate algebra or equivalent, appropriate score on the ELM examination.

**3. Expected Outcomes**

The student should be able to:

- a. Design a data collection scheme based on simple random sampling, or simple experimental designs;
- b. Summarize data using graphical and numerical techniques;
- c. Construct and interpret confidence intervals for differences between means and between proportions;
- d. Conduct two-sample hypothesis tests for means and proportions;
- e. Calculate and interpret measures of association and perform Chi-square test for independence;
- f. Use simple linear and multiple regressions to describe relationships between variables; and
- g. Perform analysis of variance tests for completely randomized and randomized block designs.

**4. Suggested Texts**

Moore, D., *Introduction to Statistics and Data Analysis*, Duxbury, 2001.

Devore, J. and Peck, R., *Statistics: The Exploration and Analysis of Data*, 4<sup>th</sup> ed., Duxbury, 2001.

Rossman, A., Chance, B., *Workshop Statistics, Discovery with Data and Minitab*, 2<sup>nd</sup> Ed., Key College Press, 2001.

Sanders, D., Smidt, R., *Statistics: A First Course*, 6<sup>th</sup> ed., McGraw-Hill, 2000.

**5. Minimum Student Materials**

Calculator for student use in preparing assignments and taking exams.

**6. Minimum University Facilities**

Chalkboard for instructional use, overhead projector.

7. **Expanded Description of Content and Method**

<b><u>CONTENT</u></b>	<b><u>NUMBER OF LECTURES</u></b>
<b>A. COLLECTING DATA</b>	4
1. Sampling (simple random, stratified)	
2. Experimentation (CRD, RBD)	
3. Causation versus association	
<b>B. TYPES OF VARIABLES</b>	1
1. Categorical, numerical	
<b>C. DESCRIPTIVE STATISTICS</b>	
1. Graphical Summaries	3
a. Univariate	
b. Bivariate	
2. Numerical Summaries	4
a. Measures of central tendency	
b. Measures of variability	
c. Measures of relative position	
d. Empirical Rule	
<b>D. INTRODUCTION to MINITAB</b>	1
<b>E. ESTIMATION</b>	5
1. Logic and interpretation of confidence intervals	
2. Two sample intervals for the difference between means	
3. Two sample intervals for the difference between proportions	
<b>F. TESTS OF SIGNIFICANCE</b>	6
1. Logic and interpretation of tests of significance	
2. P-values	
3. Two-sample tests for means and proportions	
<b>G. EXPLORING ASSOCIATION</b>	3
1. Chi-Square Test for Independence	
2. Pearson's correlation coefficient	
<b>H. SIMPLE AND MULTIPLE LINEAR REGRESSION MODELS</b>	5
1. Fitting a model using least squares	
2. Interpretation of computer output	
3. Model evaluation	
<b>J. ANALYSIS of VARIANCE</b>	4
1. One-way AOV for a Completely Randomized Design	
2. Two-way AOV for Randomized Block Design	
3. Post-hoc comparisons	
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<b>TOTAL</b>	<b>36</b>

**METHOD**

Development of fundamental concepts and methods. Statistical analysis of actual problems.

8. **Method of Evaluating Outcome**

By one or more of individual recitation, assignment of exercises, projects, and examinations.