

**Fall 2003**  
**DAY COURSE**

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**Instructor: C. Lynch**  
**Lab Instructor: R. INSLEY (SSC K 10552)**

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**Prerequisites:**

A research methods course such as SA 255, CRIM 120, POL 213 or equivalent is recommended. Students in Sociology and Anthropology are expected to take SA 255 before this course. Students with credit for ARCH 376, BUEC232 (formerly 332) or STAT 270 may not subsequently receive credit for this course. Students with credit for any of STAT 101, 102, or 103 may not take this course for further credit.

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**Textbook:**

*Elementary Statistics in Social Research* (9th ed) by Jack Levin & James Fox, Addison-Wesley

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**Calendar Description:**

An introductory course in descriptive and inferential statistics aimed at students in the social sciences. Scales of measurement. Descriptive statistics. Measures of association. Hypothesis tests and confidence intervals.

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**Outline:**

Aimed at a non-mathematical audience, this course discusses procedures that are most commonly used in research in the social sciences. The rationale for these procedures is explained in detail but the use of mathematical formulas is kept to a minimum. STAT 203 is a satisfactory prerequisite for STAT 302.

1. **The Design of a Statistical Study**

The two major design types, controlled experiments and observational studies, are discussed, with special emphasis on the limitations of each. The practical necessity of observational studies in social sciences research is discussed.

2. **Descriptive Statistics**

The following methods of summarizing the information in large datasets are introduced: histograms and other graphs, averages, standard deviations, and the normal approximation. Applications to the summary of social and political surveys.

3. **Correlation and Regression**

The correlation coefficient is introduced as a measure of the strength of association between two quantities; the regression line, as a graph of averages. Deviations from this line are discussed. Use of these techniques in formulating causal hypotheses based on studies in social sciences.

4. **Probability**

Methods are presented for computing the probabilities of chance occurrences. Examples are introduced which explain how probability is used to model the unpredictability of human responses.

5. **Chance Variability**

Fallacious interpretations of "The Law of Averages" are brought to light, and the predictable patterns that do indeed emerge in repetitions of chance experiments are discussed. The use of aggregation as a method for concentrating information from widely variable measurements, such as are encountered in social surveys.

## 6. **Sampling and Chance Models**

The concept of a sample survey is studied from the design stage through the conduct of the survey to the analysis of the results. Special attention is given to the role of chance errors on the accuracy of the results. Application to large scale surveys, such as are done regularly by Statistics Canada, are discussed.

## 7. **Estimation and Tests of Significance**

Elementary methods of analyzing the results of controlled experiments and observational studies are presented. Standard t-tests, chi-square tests, and related confidence intervals are introduced with emphasis on the role of the chance model, and the interpretation of the results. Methods for distinguishing reproducible trends from those that are temporary and due to sampling error are examined. Applications to surveys in sociology, criminology and political science.

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### **Grading:**

To be announced at the start of class

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*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required by all members of the University. Please consult the General Guidelines for details.*

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Revised May 2003