# Spring 2024

SOA 440

website = Canvas https://about.illinoisstate.edu/wleonard/

TR 8-9:15 Schroeder 214

Lab in Schroeder 235, Wednesday @ 8A

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| Instructor: | Wib Leonard |  |
| Office: | 340 Schroeder | Mailbox: | 338 Schroeder |

Office Hours: TR 7:30-8A; 10:50-12A

Email: wleonard@ilstu.edu

Office Phone: 438-8073

## Purposes of the Course

This course is an intermediate statistics course designed primarily for sociology graduate students. As much as possible, I will emphasize "social" examples because most of you are graduate students in sociology. Since most social scientists--including me--are not mathematicians, the theoretical derivation of statistical formulae will not be dealt with. In short, the purposes of the course are to acquaint you with: (1) the **logic** of social statistics, the (2) **computation** and (3) **interpretation** of “intermediate” statistical methods, and their (4) **uses** and (5) **misuses** (what is sometimes called "statistical doublespeak"). A personal goal of mine is to combat "innumeracy," the mathematical counterpart of illiteracy; that is, I will help you in becoming "statistically literate."

Finally, because social science data are processed using the computer, you will also be introduced to the creation, management and statistical manipulation of data files using *PASW* (*SPSS*).

## The Conduct of the Course

A series of lectures and a program of assigned readings teach the subject matter. The lectures do not necessarily duplicate the content of the readings; instead, they will serve to supplement, integrate, and clarify the printed material. Class participation is encouraged, particularly when there is question or confusion regarding either lectures or readings.

Attendance is assumed.

You are strongly advised to read assigned materials before attending the lecture in order to derive the maximum benefit from the class period. To facilitate your understanding of statistical techniques you will be required to do several statistical problem sets. They are expected to be completed and turned in by the due date and will be graded and returned to you.

**Objectives:** This course will develop the statistical portion of your sociological imagination (i.e., the ability to interpret quantitative, empirical work and how you can test hypotheses and discover patterns via the intelligent use of numbers). You also need to become an effective consumer and producer of social research. This course will assist you in doing both. You will be taught how statistics are generated, what they mean, and how to create them yourself--using a hand-held calculator as well as a computer. This information will permit you to understand information presented to you in empirical journal articles and other media outlets. The objectives will also provide the foundation upon which to build further statistical analyses, for use in employment outside of academia and/or in further graduate training.

**Math v. Interpretation:** This is not a math course. It’s a course in how to use mathematics to make sense of social phenomena. So, while the problems we solve and the solutions we find to those problems are mathematical, there needs to be just as much emphasis on the

interpretation of the answer. **Assume that I want you to interpret the answers**. This means putting the number within a sentence that would make sense to any reasonably intelligent person.

**Texts:** Leonard, Wib. 2016. ***Data Analytics for Univariate, Bivariate, and Multivariate Distributions***. This will be supplemented by Readings/Articles that I deem appropriate.

Agresti, Alan and Barbara Finlay. 2009. ***Statistical Methods for the Social Sciences***. Upper Saddle River NJ: Prentice-Hall. 4th Edition.

Allison, Paul D. 1999. ***Multiple Regression: A Primer*.**

Thousand Oaks, CA: Pine Forge Press.

Cronk, Brian. 2010. ***How to Use PASW Statistics.***

Glendale, CA: Pyrczak Publishing.

Healey, Joseph. 2013. **The Essentials of Statistics.** Boston: Centage Learning.

## Grading & Evaluation Standards & Criteria

* 1. Evaluations will cover all course materials including lectures, readings, motion pictures, classroom exercises, and visual aids.

## Type and Frequency of Evaluations

* + 1. There will be five evaluations, in the form of problem sets, each containing two parts: 1) computations and 2) interpretations.

Additionally, each student may choose a research project that will be presented to the class the last couple of weeks of the semester. There are multiple secondary data sets, e.g., General Social Survey, etc. that may be used. There will be no "pop quizzes" or other unscheduled examinations.

## Grading Policy

* + 1. Each evaluation will have a "point value" attached and your cumulative point total will be used in determining your final letter grade for the course. Following each you will be told the letter grade to which your score corresponds. However, letter grades are NOT cumulative-- your final letter grade is determined by your total points. Borderline cases will be decided by the instructor based on demonstrated improvement, attendance, application, class participation, and interest. It is your responsibility to maintain a record of your points on each examination and keep a running total.

**Tools:** Please bring a calculator and modules to each class period.

We will not use them each meeting, but they’ll often come in handy. Functions needed on your calculator include standard functions (i.e., + -

\* and /), square root, log, and natural log (ln). Memory, parentheses,

square, and inverse will also be helpful. Graphing calculators are not necessary.

**Homework:** There will be written homework assignments on a regular basis. Show your work; don’t just give an answer. Please

##  “hightlight” your nume rical answ ers .

**Computer Work:** At various times your homework will consist of short computer assignments with explicit instructions from me. These will also be graded and will be added to your other grades too.

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Chapter 7 DATA PREPARATION AND DATA PROCESSING: A PRELUDE TO DATA ANALYSIS



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Chapter 8 TABULAR REPRESENATION OF UNIVARIATE AND BIVARIATE QUALITATIVE VARIABLES: SINGLE AND CROSS- CLASSIFICATION SCHEMES



Chapter 9 DESCRIPTIVE STATISTICS FOR UNIVARIATE DISTRIBUTIONS



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Chapter 10 DESCRIPTIVE STATISTICS FOR BIVARIATE DISTRIBUTIONS



Chapter 10.zip

Chapter 11 DESCRIPTIVE STATISTICS FOR MULTIVARIATE DISTRIBUTIONS



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Chapter 12 INFERENTIAL STATISTICS: PARAMETRIC AND NON-PARAMETRIC TECHNIQUES



Chapter 12 Inferential Statistics.zip

Chapter 13 WRITING THE RESEARCH REPORT



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