L A K E H E A D   U N I V E R S I T Y
DEPARTMENT OF SOCIOLOGY

SOCI-4317/5112-WA: **Quantitative Sociology**
Professor: **Dr. Jianye Liu**
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Office Hours: **Tuesday & Thursday: 12:00-1:00 p.m. or by appointment**
Classes: **RB 2027,   Monday, 11:30AM-2:30PM.**

Course Description:

Sociology 5112 WA is a half year course designed to provide students with a preliminary understanding of the skills and knowledge required to do multivariate analysis. Social phenomenon is complex in nature and can rarely be explained by one variable. Classical methods that try to explain social phenomena by analyzing just one variable at a time are inappropriate in most circumstances. A multivariate approach that considers many variables simultaneously leads to greater insight and better understanding of the complex social phenomena.

This course will cover a series of multivariate techniques that are useful for analyzing social phenomena. Emphasis will be on extracting quantitative information out of existing data sets; selecting correct analytical tools; and paying special attention to the assumptions underlying those tools. The statistics software used for data analysis is SPSS (Statistical Package for the Social Sciences). Therefore, this course will train students how to use SPSS to analyze survey data and to interpret the results correctly.

Text
No specific textbook is required for this course. You should attend each class and try to understand my lecture (the class notes). I recommend you read some of the following books after class, if you have time and want to understand more details such as the underlying mathematical procedure (I will put all of them on reserves in the Library):

1. Agresti, Alan and B. Finlay, 1997. Statistical Methods for the Social Sciences, 3rd or latest edition. Upper Saddle River: Prentice-Hall.

2. Healey, J.F. 2005. Statistics: A Tool for Social Research. Belmont, CA: Wadsworth.

3. Achen, C.H.1983. Interpreting and Using Regression. Beverly Hills, California: SAGE publications.

4. Reynolds, H.T. 1988. Analysis of Nominal Data. Beverly Hills, California: SAGE publications.

5. Hildebrand, K. David, James D. Laing, and Howard Rosenthal. <u>Analysis of Ordinal Data</u>. Beverly Hills, California: SAGE publications.

6. Kim, Jae-On and C.W. Mueller. 1988. <u>Factor Analysis: Statistical Methods and Practical Issues</u>. Beverly Hills, California: SAGE publications.

7. Allison, D. Paul. 1984. <u>Event History Analysis: Regression for Longitudinal Event Data.</u> Beverly Hills, California: SAGE publications.

8. Puri, K. Basant. 2002. SPSS in Practice: An Illustrated Guide. New York, NY: Arnold.

Courses requirements:

1. Assignments:

An emphasis will be on the application of the many concepts and techniques covered in class. Through a series of 3assignments, students will have an opportunity to apply what they have learned and subsequently obtain some feedback. Each assignment will be marked and returned, some will be discussed in class, and students can always meet with the instructor to discuss possible difficulties or concerns.

The three assignments will carry a total of 45% of your final grade (15% each). Assignments should be submitted on or before due date. If you have a valid reason prevents you from submitting an assignment on the due date, please inform me in advance.

2. Term paper:
You are required to write a term paper which involves multivariate data analysis. IT IS WORTH 25% OF YOUR FINAL GRADE. This paper should include a short introduction about what you are going to write, a brief literature review, data and method, findings, and conclusion. The length of the paper should not be more than 15 pages and the core of the paper is to apply techniques learned in class in data analysis. That is, based on the data set used for your project, you should choose appropriate method to analyze your data.

3. Final Examination:
The final examination during the December exam period will carry 30% of your final grade. It will be 3 hours in length and may have multiple choice, short answer problems and major problems. Students are responsible for the entire statistics portion of the course for the final examination. It is advisable that you bring a calculator to the exam, just in case of technical problems

Distribution of Grades:
3 assignments	45%
Term paper	25%
Final Examination	30%

Course outline

DATE   **TOPIC**

January 8   Introduction and review of SOCI 3311:
                  Level of measurement (Neuman chapter 7)
                  Measures of central tendency (Healey chapter 3)
                  Measures of dispersion (Healey chapter 4)
                  Shapes of distributions (Healey chapter 5)

January 15   Statistics significance (Healey chapter 6-11)
                  Chi-square test and ANOVA

January 22   Measure of bivariate associations (Healey chapter 12-15)
                  Time dimension in research
                  Causality
                  Simple regression
                  Underlying assumptions
                  Assignment 1 (Due on Feb. 5)

January 29   Introduction to multivariate relationship (Agresti & Finlay chapter 10-12)
                  Type of multivariate relationships
                  Multivariate regression
                  Qualitative variables in regression
                  Interaction effects in regression

February 5   ANOVA in regression (Agresti & Finlay chapter 13), Two-way ANOVA
                  and Regression and ANCOVA

February 12   Analysis of Nominal Data: Logistic regression (Reynolds, H.T. and
                  Agresti & Finlay chapter 15)
                  Assignment # 2 (Due on Mar. 5)

February 19-23   Reading Week

February 26   Event history analysis (Paul D. Allison and Agresti & Finlay chapter 16)

March 5   Problems of Multicollinearity (Agresti & Finlay chapter 14)
                  Factor analysis (Agresti & Finlay chapter 16)

March 12   Analysis of Ordinal Data (Hildebrand, Laing, and Rosenthal)
                  Assignment # 3 (Due on Mar. 26)

March 19   Mediation and Path Analysis

March 26   Moderation

April 2   Multilevel model

NB . The dates for class coverage of topics are only best approximations.