I. COURSE DOMAIN AND BOUNDARIES

This is the second course in the research methods sequence for WSU doctoral students. This course provides an overview of OLS regression, logistic regression, and multinomial logit models. At the end of this course, students will be able to apply the array of regression models to analyze data obtained from social work practice settings. Students will learn to conduct these analyses using SPSS, interpret their findings, and communicate their results clearly and effectively to both scholarly and social work practice audiences. Prerequisite: SW 9100 Social Statistics and Data Analysis or equivalent.

II. KNOWLEDGE AND SKILL OBJECTIVES

By the end of this course, the student should be able to identify and apply:

1. choose and apply appropriate regression techniques to address research questions and hypotheses;
2. Use SPSS for regression analyses;
3. interpret findings;
4. communicate results clearly and effectively, using APA format;
5. understand statistical assumptions and how to detect and address violations;
6. recognize strengths and weaknesses in analyses and formulate constructive critiques.

III. PERFORMANCE CRITERIA

Students are required to complete three “take-home” exercises and three papers. The “take-home” exercise consists of critically reviewing three quantitative studies and exercises of regression models. The papers require students either to perform data analyses using SPSS, present the findings using APA journal article format, and interpret the results. They should pose a question for research, propose research hypotheses, and present analysis findings. The first paper will apply a multiple regression analysis; the second will apply a logistic regression analysis and the third will apply logit analysis. Data sets from social work practice settings will be provided in class, but students may use their own data if appropriate.
Each assignment counts as 20% of the final grade. The assignment topics are as follows:

Exercise #1 Simple Linear Regression
Exercise #2 Multiple Linear Regression
Exercise #3 Weighted Least Squares and Hierarchical Linear Regression Models
Paper #1 Research Study Using Multiple Regression Analysis
Paper #2 Research Study Using Logistic Regression Analysis
Paper #3 Research Study Using Multinational Logit Analysis

Papers will be graded according to the following scale:

A. Excellent, exceeds expectations; superior performance
B. Good, meets all normal expectations; consistent grasp of content and competency in meeting course objectives
C. Fair, meets some expectations but misses others; acceptable but barely adequate; uneven grasp of course content

IV. REQUIRED TEXTS/REQUIRED MATERIALS


RECOMMENDED TEXTS


V. COURSE OUTLINE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Session 1</td>
<td>Introduction and Overview</td>
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<td>Course overview</td>
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<td></td>
<td>Critical review of quantitative studies</td>
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<td></td>
<td>Review of basic concepts</td>
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</tbody>
</table>

**Readings:** Neter et al., Ch. 1.1-1.2; Guo, S. (2000). The need to conduct quantitative research rigorously: A critique. *Social Work Research*, 24, 61-64.
Session 2  
*Simple Linear Regression*
Optimization: minimization versus maximization
Least-squares estimator
Interval estimation and hypothesis (t-test)

**Readings:** Neter et al., Chs. 1.3-1,7;2
SPSS Lab 1: Bivariate Regression Analysis Using SPSS

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Session 3  
*Multiple Linear Regression*
Model specification
Estimate of regression coefficients
Inferences concerning B

**Reading:** Neter et al., Ch. 6.1-6.8

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Session 4  
**The ANOVA Table and R2**
Decomposition of total sum of squares, F test
R2 and Adjusted R2
Application Examples

**Reading:** Neter et al., Ch. 6.9

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Session 5  
**Running Multiple Regression Analyses**
F test for Partial Slopes

**SPSS Lab II:** Multiple Regression Analysis Using SPSS

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Session 6  
**Properties of OLS and the Five Assumptions**
BLUE criterion and properties of OLS
The five OLS assumptions
Specification errors and selection of predictors

**Reading:** Neter et al., Chs. 1.8,3

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Session 7  
**Violating OLS Assumptions and Remedial Measures - 1**
Influential data and outliers
Multicollinearity

**Reading:** Neter et al., Chs. 7.6, 8.1-8.3, 9.1-9.5

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Session 8  
**Violating OLS Assumptions and Remedial Measures – 2**
Heteroskedasticity
Weighted Least Squares
Correcting heteroskedasticity and using WLS
**Reading:** Neter et al. Ch. 10.1

**SPSS Lab III:** Weighted Least Squares Regression Using SPSS

**Session 9 Other Topics in Regression Analysis – 1**
Regression through origin
Partial-correlation coefficient
Standardized regression coefficient
R2 increment: Hierarchical regression analysis
Functional form, curvilinear relationships and polynomial regression models

**Readings:** Neter et al: Ch. 4.4, 7.4-7.5, 7.7

**SPSS Lab IV:** Hierarchical Linear Regression Using SPSS

**Session 10 Other Topics in Regression Analysis – 2**
Dummy variables as predictors
   Interpretation of regression coefficients
   Comparison of several regression equations
Testing interactions:
   Mediator versus moderator
   Interaction, joint effect and moderator

**Readings:** Neter et al., Ch. 11

**Session 11 Logistic Regression Analysis – 1**
Dummy as a dependent variable: Why logistic regression?
Maximum likelihood estimator
Relative risk and odds ratio

**Readings:** Neter et al., Ch. 13; 14

**SPSS Lab V:** Logistic Regression Analysis Using SPSS

**Session 12 Logistic Regression Analysis – 2**
   Linear model
   Correlation and causation
   Descriptive and inferential uses

**Session 13 Logistic Regression Analysis – 3**
Calculation of Predicted Probabilities
Other models: multinomial logistic regression and ordinal logistic regression

**SPSS Lab VI:** Multinomial Logit Analysis Using SPSS
Supplemental Texts


