POLI 471-01
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POLI 471 - RESEARCH SEMINAR FOR PUBLIC DECISION MAKING

COURSE DESCRIPTION:

This course examines the statistical techniques commonly used in public policy analysis, program estimation and evaluation, and public decision-making. Statistics refers to a set of mathematical tools that can be used to understand data, enhance communication of public action, and improve public decision-making. Although the tools are powerful, and sometimes intricate, the modern computer has made them useful as a formal, explicit, rational basis for addressing public problems. Public sector professionals should learn how they work, when to use them, and how to interpret and apply the quantitative results to problems at hand. The objectives of the course are as follows:

1. To introduce the student to the relationship between statistic and public management.
2. To increase the student’s understanding and ability of to identify the many different types of problems, variables and measurements.
3. To enhance the student’s capability of statistical analysis procedures necessary for formal, explicit, rational basis for decision-making.
4. To provide the student with the formal tools for empirically observing and describing the past, present, and future state of affairs, and evaluating the difference between what they observed and what they expect.
5. To provide the student with the capability of identifying which statistical method to apply to a given problem.

PREREQUISITE:

An introductory undergraduate course in statistics, social science research methods or equivalent is required.

COURSE REQUIREMENTS:

Students are responsible for all text assignments and other material assigned. The course is designed around a lecture, class exercise and a term project format. Class exercise will require prepared student participation. The final grade will be based on five (5) take-home class exercises, a final exam, class participation, and a public policy term project. Students may use any of the major statistical software programs (SPSS, STATA, SAS,
MinTab, etc.) for performing all the assignments. However, the Statistical Package for Social Science (SPSS) is highly recommended. CLASS ATTENDANCE IS MANDATORY and will count towards class participation grade. Excused absence can only be granted by presenting proof of life-treating or extreme extraneous circumstance.

COURSE GRADE:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Take-home Exercises</td>
<td>40%</td>
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<tr>
<td>Discussion</td>
<td>10%</td>
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<tr>
<td>Research Report Presentation</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>10%</td>
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<tr>
<td>Research Report</td>
<td>30%</td>
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REQUIRED TEXT:


SUPPLEMENTAL READING:


STRONGLY RECOMMENDED

A personal computer with SPSS software.

TERM PROJECT:

The term project applies statistical analysis procedures to actual public policy research problem. The student may select a problem in any public policy area. Submit a background description of the problem, research question(s), research variables and measurements of interest, a raw data set, analysis of assumptions, appropriate analytic procedure(s) or model(s) and why, computation set-up and decision rule, results, a discussion interpreting the meaning, usefulness and implication of the results, and public policy recommendation or application of the results. The student is required to present the research report in its preliminary form in class. The final research report is due on May 03, 2013. LATE REPORTS WILL NOT BE ACCEPTED.
## COURSE OUTLINE:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics and Assignments</th>
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| **Week 1: January 7-11** | A. Review of books and requirement  
B. Question about the course  
C. Role of quantitative analysis in Public Administration |
| **Week 2: January 14-18** | Statistical Analysis and Public Management  
A. Role of statistics in Public Management  
B. Description, Evaluation, and Estimation  
C. Problem Identification  
D. Types Research Questions  
E. Variables and Measurements  
F. Levels of Measurement  
G. Units of Analysis  
Assignment 1: Research Abstract  
Assigned Reading:  
Giventer, chapters 1 & 2  
Carver & Nash, Session 1 |
| **Week 3: January 21-25** | One Variable Description  
A. Nominal Level Measurement  
B. Ordinal Level Measurement  
C. Interval or Ratio Level Measurement  
Assignment 2: IRB Certification/SPSS dataset construction (secondary data)  
Assigned reading:  
Giventer, chapter 3  
Carver & Nash, Session 2 |
| **Week 4: January 28-Feb. 1** | Two Variable Description  
A. The data file  
B. Crosstabulation  
C. Scatterplot  
D. Take Home Exercise 1 |
Assignment: SPSS Dataset construction (primary data); Scatterplot
Assigned reading:
  Giventer, chapter 7
  Carver & Nash, Session 3

Week 5: February 4-8
One Variable Estimation
A. Confidence Intervals
B. Estimation of Sample size
C. Take Exercise 1 due

Assignment: SPSS Frequency distribution Table, Bar Chart and Pie Chart
Assigned reading:
  Giventer, chapter 6
  Carver & Nash, Session 4

Week 6: February 11-15
One Variable Evaluation-Nominal Measure
A. Two Categories
B. More than Two Categories
C. Assumptions
D. Return Take Home Exercise 1
E. Take Home Exercise 2

Assignment: SPSS
Assigned Reading:
  Giventer, chapter 4
  Carver & Nash, Session 11

Week 7: February 18-22
One Variable Evaluation-Ordinal & Interval Measures
A. Ordinal Level of Measurement
B. One Variable-Interval Level of Measurement (n>30)
C. Take Home Exercise 2 due

Assigned reading:
  Giventer, chapter 11

Week 8: February 25-March 1
Two Variable Evaluation: Nominal-Nominal Measures
A. Both Variables Have Two Categories
Unpaired Data, n>30
  Z Test for the
  Difference Between
  Two Proportions
  Odd Ratio and
  Relative Risk Ratio
  Somer’s d Statistic
  Yule’s Q

Unpaired Data, 26<n≥250
  Chi-Square Test with
  Yates’s Correction
  Phi Statistic

Unpaired Data, n≥26
  Fischer’s Exact
  Probability Test

Paired Data
  McNemar Test for
  Significance of
  Change

B. Return Take Home Exercise 2
C. Take Home Exercise 3

Assigned reading:
  Giventer, chapter 8
  Carver & Nash, Session 12

Week 9: March 4-8

Two Variable Evaluation: Nominal-Nominal
Measures II

A. Both Variable Have More than Two
Categories
  Chi-Square Test
  Cramer’S V Statistic
  Lambda Statistic

B. Matched Data
  Cochran Q Test

C. Take Home Exercise 3 due

Assigned reading:
  Giventer, chapter 8
  Carver & Nash, Session 12

Week 10: March 11-15

Two Variable Evaluation: Nominal-Ordinal
Measures
A. Nominally Measured Variable Has Two Categories
   Unpaired Data
      Mann-Whitney U Test
      Kolmogorov-Smirnov Two-Variable Test
      Somer’s d Statistic
   Paired Data
      Wilcoxon’s Matched Pairs Sign-Rank Test
B. Nominally Measured Variable Has More Than Two Categories
   Kruskal-Wallis Test
C. Return Take Home Exercise 3
D. Take Home Exercise 4

Assignment:
Assigned reading:
   Giventer, chapter 9
   Carver & Nash, Session 21

Week 11: March 18-22

Two Variable Evaluation: Ordinal-Ordinal and Ordinal-Interval Measures

A. Spearman Ranked Correlation Coefficient
B. Goodman and Kruskal’s Gamma Statistic
C. Somer’s d Statistic
D. Kendall Tau Statistic
E. Take Home Exercise 4 due 21

Assigned reading:
   Giventer, chapter 10
   Carver & Nash, Session 21

Week 12: March 25-29

Two-Variable Evaluation: Nominal-Interval Measures

A. The Independent Variable Has Two Categories
   Two Variable t-Test for Unpaired Data
   Randomization Test for Unpaired Data
   Two-Variable Test for Paired Data
Randomization Test for Paired Data
B. The Independent Variable Has More Than Two Categories
   Analysis of Variance F Test
   Eta-Square Statistic
C. Return Take Home Exercise 4
D. Take Home Exercise 5

Assignment:
   Giventer, chapter 11
   Carver & Nash, Session 13 & 14

Week 13: April 1-5
Two Variable Evaluation: Interval-Interval Measures
A. Regression Analysis
B. Strength of Association
   Correlation Analysis
C. Correlation is Not Causality
D. Assumptions
E. Take Home Exercise 5 due
Assignment:
   Giventer, Chapter 12
   Carver & Nash, Session 15

Week 14: April 8-12
Two Variable Estimation: Interval-Interval Measures
A. Regression Analysis
B. Population Regression Coefficient
C. Population Coefficient of Determination and Correlation Coefficient
D. Confidence Interval for Estimating Individual Values of Y
E. Confidence Interval for Estimating $\hat{Y}_x$
F. Research Project Presentation
G. Return Take Home Exercise 5

Assignment:
   Giventer Chapter 13
   Carver & Nash, Session 16

Week 15: April 15-19
More Two Variable Evaluation or Estimation
A. Multiple Regression Analysis
   - F Ratio
   - Regression Coefficients
   - Beta Weights
   - T Values
   - Significance of t Value
B. Time Series Analysis
C. Dummy Variable Regression Analysis
D. Research Project Presentation

Assignment:
Assigned reading:
   - Giventer Chapter 14
   - Carver & Nash, Session 17

April 29-May 5

A. Research Report due

****HAVE A VERY RESTFUL SUMMER!!!***