

**UNIVERSITY OF PENNSYLVANIA**  
*School of Social Policy & Practice*  
**SWRK 729 Social Statistics Fall 2018**  
**Thursdays 4:00-6:30 p.m.**  
**Multi-Media Services PC1 Lab**  
**Basement, David Rittenhouse Laboratory**  
**209 South 33rd Street**

**COURSE PURPOSE:**

This course is designed to provide students with a broad range of statistical methods and applications commonly used for policy analysis, research, planning and decision-making. Topics covered include conceptualization and measurement of variables, and basic concepts and techniques for exploring and categorizing data, for generalizing research findings and testing hypotheses, and for statistical data processing. An emphasis will be placed on the practical application of data to address social policy and social work practice issues, rather than theoretical and mathematical development. Students will learn how to choose and apply statistical tools to data sources, when and how statistical tools can be used to analyzed data, and how to interpret others' quantitative studies. Students will gain experience using window-based spreadsheet and statistical software package.

For MSW students, this course builds on the foundation of knowledge and skills of SW 615, which introduces students to social research methods in the context of social work practice and social welfare, and of quantitative methods and skills gleaned from undergraduate studies in liberal arts courses, such as mathematics and methods of social inquiry. SW 729 builds on knowledge of social work practice (SW 604, 614; SW 704, 714; SW 708, 718) and social policy analysis (SW 601 and SW 611) by applying statistical methods for planning and evaluating practice, social programs and social policy. The material taught in this course is linked with American racism and other forms of oppression (SW 603) by focusing on the interpretation of quantitative data that is sensitive to diversity and group differences, as well as issues of social and economic justice, including gender inequity, oppression on the basis of race/ethnicity, age and sexual orientation, and income inequality.

**EDUCATIONAL OBJECTIVES:**

Upon completion of this course, students will be able to:

1. Explain, calculate, and interpret descriptive statistics including scales of measurement, frequency distributions, measures of central tendency, measures of dispersion, standard scores, and the normal curve;
2. Read, construct, and analyze charts, graphs, and contingency tables;
3. Understand the basic concepts of inferential statistics including probability, confidence intervals, and hypothesis testing;
4. Understand the basic concepts of association between variables;
5. Identify and appropriately apply parametric and non-parametric statistical procedures;
6. Understand the basic concepts of multivariate analysis;
7. Gain experience using computer technology in the application of statistical procedures;

- Assess the inferential process and data analyses of social work and policy research studies presented in the form of technical reports and professional journals.

## COURSE REQUIREMENTS

### A. Text & Readings

The following text will be used throughout the semester and is available at Penn Bookstore:

Healey, J.F. (2016). *The Essential of Statistics: A Tool for Social Research* (4<sup>th</sup> ed.), Belmont, CA: Wadworth Cengage Learning (ISBN: 9781305093836). Note that students may use an earlier version of the textbook but the syllabus is based on the 2016 edition.

### B. Course Assignments

- Three individual homework assignments will be given throughout the semester, totaling **50%** of course grade. The assignments will include computation of descriptive and inferential statistics, and interpretation of statistical results. The due dates of the assignments and number of points (on a 100-point scale) assigned to each assignment are as follows:

<u>Assignment</u>	<u>Due date</u>	<u>Number of points</u>
Assignment 1	9/20/18 (Thursday)	20
Assignment 2	11/1/18 (Thursday)	20
Assignment 3	11/29/18 (Thursday)	10

- A group data analysis report will be due on **December 13, 2018 (Thursday)**. The group data analysis report should be 8-10 single-spaced pages in length (including graphics and tables embedded in text) and must contain empirical analysis in the form of tables, graphs, and hypotheses testing. The text portion of the report can be in bullet form. The objective of the report is to communicate, in an accessible manner, statistical information about a practice, policy, or social issue. Project groups will work with the instructor to identify a dataset based on their research topic. A proposal outlining the data analysis report and the dataset to be used will be due on **October 18, 2018 (Thursday)**. Students will use *SPSS for Windows* to conduct the analysis. Students will work in **groups of 2-3** and present the results of the project in class. Assessment of the written project report will be based on the content, analytic reasoning and statistical techniques, writing, and tabular/graphical presentation. The written report will constitute **50%** of course grade.
- There will be 2 in-class quizzes. Students will answer the quiz questions before class and discuss their answers during class. The purpose of the quizzes is to facilitate the learning process. There is no credit assigned to these quizzes.

### C. Grading Policy:

The grade will be based on a percentage score reflecting the extent to which the student meets the course objectives as demonstrated in the required assignments. Students have to pass **ALL** components of the course assignments to attain a passing grade.

#### **D. Class Participation & Expectations:**

Classroom learning is a group activity that depends upon everyone's full participation in order to succeed. I expect students to: be prepared to begin class on time, silence or turn off and put away cell phones and other electronic devices, submit assignments on time, and assist your classmates. Follow class instructions and do not multi-task during class. Doing so is disrespectful to your classmates and distracts them from learning the course material.

You can expect that I will: be on time and prepared for every class, be available via email and appointments to answer questions and help you with homework, make every class engaging and valuable, and respect your contributions to class. Specific to my accessibility via email: I will make every effort to reply to emails received on weekdays within 48 hours.

#### **E. Attendance Policy:**

This class will meet twice a week. Classroom learning is a fundamental component of your education. Attendance is, therefore, expected and will be considered in the determination of overall achievement of class learning objectives. In the event that you are sick or cannot attend class for other reasons, you should notify your class instructor.

Students who miss a class (in whole or in part) are responsible for finding out what took place during their absence(s) and for securing copies of any materials distributed.

#### **F. Grading:**

A+	97 – 100
A	94 – 96
A-	90 – 93
B+	87 – 89
B	84 – 86
B-	80 – 83
C+	77 – 79
C	74 – 76
C-	70 – 73
F	Below 70

#### **G. Preparation and submission of assignments:**

For the homework assignments, students must hand in their own work, demonstrating individual efforts. It is not acceptable for students to submit identical or near-identical narratives.

Students should submit their assignments electronically via CANVAS. Electronic copies of assignments must be saved in a format that is readable by software in the instructor's computer.

#### **PENN POLICY ON PLAGIARISM**

If you present someone's words, thoughts or data as your own, you are committing plagiarism—you are

stealing. The location of the information is irrelevant: when it comes to plagiarism, information from the Internet is equivalent to information from a physical book or journal. To avoid plagiarism, you must cite the original author every time you:

- Use an author's exact written or spoken words. In this case, you must also identify the words by enclosing them with quotation marks or indenting the quote on both sides of the margin.
- Paraphrase someone's written or spoken words.
- Use facts provided by someone else that are not common knowledge.
- Make significant use of someone's ideas or theories.

It is also plagiarism to pay a person or Internet service for a paper, hand in someone else's paper as your own, or cut and paste text from the Internet to your paper without citing the source.

### **Consequences**

Students caught plagiarizing may face either academic or disciplinary negative consequences. Instructors who determine that a paper includes plagiarized material can take academic measures, such as giving a failing grade for the paper. If the instructor decides that disciplinary measures should be taken, the case will be referred to the Office of Student Conduct. If the student is found responsible following formal procedures, the student may face a number of sanctions—including suspension. Whatever the sanction, academic integrity action by the Office of Student Conduct becomes a part of the student's permanent record and may have an adverse impact on future academic and career goals.

#### **The source for this text is:**

[http://gethelp.library.upenn.edu/PORT/documentation/plagiarism\\_policy.html](http://gethelp.library.upenn.edu/PORT/documentation/plagiarism_policy.html)

### **Statement of Academic Integrity**

Students are expected to conduct themselves consistent with the University of Pennsylvania's Code of Academic Integrity, which presents standards regarding plagiarism, multiple submissions and other actions. Students are expected to be familiar with the Code, which can be found at (please cut and pasted the following link):

<https://next.catalog.upenn.edu/pennbook/code-of-academic-integrity/>

**CLASS SCHEDULE:**

<b>Week</b>	<b>Date</b>	<b>Description</b>	<b>Readings</b>
1	8/30/18	<p><b>Quantitative Research &amp; Descriptive Statistics I</b></p> <ol style="list-style-type: none"> <li>1. Overview of quantitative research methods</li> <li>2. Variables and levels of measurement</li> <li>3. Percentages, proportions, ratios, rates, and percentage change</li> <li>4. Tables, charts, and graphs</li> </ol> <p><b>Data Analysis Project</b></p> <ol style="list-style-type: none"> <li>1. Students' practice background and preliminary topic of interest (Qualtrics)</li> <li>2. Educational goal and learning objectives</li> <li>3. Examples of projects conducted by previous cohorts</li> <li>4. Software programs for statistical computation: Excel &amp; IBM SPSS</li> </ol>	Healey, preface, prologue, chapters 1 & 2
2	9/6/18	<p><b>Descriptive Statistics II</b></p> <ol style="list-style-type: none"> <li>1. Measures of central tendency: Mode, median and mean</li> <li>2. Measures of dispersion: Range, interquartile range, and standard deviation</li> <li>3. Graphic presentation</li> <li>4. Choosing among measures of central tendency &amp; dispersion</li> </ol> <p><b>Data Analysis Project</b></p> <ol style="list-style-type: none"> <li>1. Research topic, questions, and hypotheses (Qualtrics)</li> <li>2. Formation of project groups</li> </ol>	Healey, chapters 3 & 4
3	9/13/18	<p><b>Penn library resources: guides, aids, and data archives</b></p> <ol style="list-style-type: none"> <li>1. How to identify and access secondary datasets for your data analysis project? (ICPSR, Community Health Data Base, General Social Survey, other open access data, geographic data)</li> <li>2. Importing data into SPSS</li> <li>3. Consultation on statistical packages</li> </ol> <p><b>Speakers:</b>            Anne Larrivee            Social Science Librarian; Collection Analyst            Lauris Olson            Librarian &amp; Coordinator of Social Sciences Collections</p>	

Week	Date	Description	Readings
4	9/20/18	<p><b>The Normal Curve and Its Transformation</b></p> <p><b>Introduction to Inferential Statistics</b></p> <ol style="list-style-type: none"> <li>1. The normal curve and standard normal curve</li> <li>2. Z scores and Z distribution</li> <li>3. Examples using the Z score table</li> <li>4. Descriptive and inferential statistics</li> <li>5. Randomness and probability sampling</li> </ol> <p><b>Assignment 1 due</b></p>	Healey, chapters 5 & 6
5	9/27/18	<p><b>Introduction to Inferential Statistics: The Sampling Distribution</b></p> <p><b>Estimation Procedures</b></p> <ol style="list-style-type: none"> <li>1. The sampling distribution and the Central Limit Theorem</li> <li>2. Estimation Procedures</li> </ol> <p><b>Data Analysis Project</b></p> <ol style="list-style-type: none"> <li>1. Identifying a ready-to-analyze dataset</li> <li>2. Refining your research questions and hypotheses</li> </ol> <p><b>Discussion of quiz I (no credit)</b></p>	Healey chapter 6
6	10/4/18	<i>No Class (Fall Break)</i>	
7	10/11/18	<i>No Class on October 11</i>	
		<p><b>Consultation Meetings on Data Analysis Project (10/8/18-10/10/18; 10/15/18-10/17/18)</b></p> <ol style="list-style-type: none"> <li>1. Confirmation and review of dataset to be used</li> <li>2. Development of proposal outline</li> </ol>	
8	10/18/18	<p><b>Confidence Intervals</b></p> <p><b>Hypothesis Testing: One-Sample T-Test</b></p> <ol style="list-style-type: none"> <li>1. An overview of hypothesis testing</li> <li>2. The five-step model for hypothesis testing</li> <li>3. Hypothesis testing in the one-sample case</li> </ol> <p><b>Data Analysis Project</b></p> <ol style="list-style-type: none"> <li>1. Having a good grasp of the dataset—variables; levels of measurement; coding</li> <li>2. Identifying and dealing with missing data</li> </ol> <p><b>Proposal outline due</b></p>	Healey, chapters 7

Week	Date	Description	Readings
9	10/25/18	<p><b>Hypothesis Testing: Independent-Samples T-Test &amp; ANOVA</b></p> <ol style="list-style-type: none"> <li>1. The Student's t distribution and hypothesis testing in the two-sample case</li> <li>2. Analysis of variance (ANOVA)</li> </ol> <p><b>Data Analysis Project (weeks 9 &amp; 10)</b></p> <ol style="list-style-type: none"> <li>1. Sample weights</li> <li>2. Construction of new variables</li> <li>3. Working with multi-item scales</li> </ol>	Healey, chapters 8 - 9
10	11/1/18	<p><b>Chi Square and Bivariate Association between Nominal-Level Variables</b></p> <ol style="list-style-type: none"> <li>1. The logic of chi square test for independence</li> <li>2. The computation of chi square</li> <li>3. Association between variables and the bivariate table for nominal-level variables</li> </ol> <p><b>Assignment 2 due</b></p>	Healey, chapters 10 - 11
11	11/8/18	<p>Bivariate Association for Interval-Ratio Level and Ordinal-Level Variables</p> <ol style="list-style-type: none"> <li>1. Correlation and causation</li> <li>2. Scattergrams</li> <li>3. Interpreting correlation</li> <li>4. Measures of association for interval-ratio level and ordinal-level variables</li> </ol> <p><b>Data Analysis Project</b></p> <ol style="list-style-type: none"> <li>1. Variable types and statistical tests</li> </ol> <p><b>Discussion of Quiz II (no credit)</b></p>	Healey, chapters 11-12
12	11/15/18	<p><b>Regression analysis</b></p> <ol style="list-style-type: none"> <li>1. Simple regression: The computation and interpretation of <math>a</math>, <math>b</math>, Pearson's <math>r</math>, <math>r^2</math> &amp; test of significance for <math>r</math></li> <li>2. Total, explained, &amp; unexplained variance</li> </ol> <p><b>SPSS Lab: Data analysis for the group data analysis project</b></p>	Healey, chapters 13

Week	Date	Description	Readings
13	11/20/18 (Tues)	<b>Multivariate analysis: Multiple regression and three-way cross tab (contingency table)</b> 1. Multiple regression: Assessing the effects of more than one independent variables 2. Use of control variables 3. Bivariate relationship between 2 nominal variables with a 3rd control variable  <b>SPSS Lab: Data analysis for the group data analysis project</b>	
14	11/29/18	<b>SPSS Lab: Data analysis for the group data analysis project</b>  <b>Assignment 3 due</b>	
15	12/6/18	<b>Presentation of data analysis projects</b>	
	12/13/18 (Thurs)	<b><i>Due: Group Data Analysis Report</i></b>	