Course Description
The course is designed as an introduction to research methods and basic statistical methods in policy analysis and management with emphases on interpreting and presenting statistical outputs, including reports generated by computer programs.

Prerequisites
There are no prerequisites for this course. Students are not expected to have studied statistics previously, but basic competency in mathematics and algebra is assumed. Students who wish for a more mathematically oriented introduction to statistics primarily through probability theory are encouraged to investigate appropriate courses in other department.

Student Learning Outcomes
The overall objectives of the course are to prepare students to develop an adequate level statistical literacy in term of a sound understanding of research design and implementation, quantitative data analysis, and interpretation of results. This will allow students to examine research results critically and design research on important policy and public administration issues.

By the end of the semester, you will be comfortable with many key concepts in statistics. You will be better equipped in using various sources of policy analysis as well as conducting basic analysis yourself. Specifically, you will learn how to:

- Transform ideas into quantitative research
- Formulate research questions and testable hypotheses.
- Read and interpret basic quantitative analysis related to questions in public administration.
- Perform simple statistical computations in statistical software.
• Match statistical techniques to the analytical questions we want to ask.
• Communicate statistical analyses results for a non-technical audience.

**Learning Approach**

Learning statistics is not just studying formulas and numbers. More importantly, we can think statistics as a way to understand how the world works. In doing so, we will focus on statistical literacy, reasoning, and thinking.

Statistical literacy involves understanding and using basic terminologies and tools of statistics by recognizing and understanding statistical symbols, and interpret representation of data. Statistical reasoning refers to how we use statistical ideas and make sense statistical information to understand and explain statistical processes and interpret statistical results. Statistical thinking is understanding how and why we conduct statistical analyses. By recognizing and understanding the overall process of quantitative research, you understand when and how to use each of the statistical techniques and make appropriate inferences.

In order to enhance your learning, we will use a learning model in which you will study and acquire a basic understanding of the material before class. This will allow us to use class time for working out more difficult concepts and applications.

**Before class,** you need to:

• Obtain study guide that I will post in the Blackboard. The study guide will help you to study the materials and prepare for readiness assessment quizzes.

• Read and study the assigned reading; focus on the material covered by study guide.

**During class time,** you will take the weekly readiness assessment quiz at the beginning of each class meeting. You will first complete the quiz by individually then you will work with your group to answer the questions. The final grade of each quiz will be based on individual and group scores. This readiness assessment quiz is to help you prepared mentally for the class activities and for your accountability to the rest of the class. The class activities will include group activities, mini lectures, and hands on experience of conducting statistical computation manually or using software package.
After class, you will complete problem sets. Problem sets consist of a mix of manual computation and computer work. The problem sets build on material covered during class focusing on advanced application of the materials.

Textbook and other materials


There is a new edition (9th edition) and it is very expensive. However, the differences between editions are very limited. You should be able to purchase a used copy or rent it from Amazon for a reasonably affordable price.

- Supplementary readings will be posted on Blackboard. Be sure to check Blackboard regularly as supplementary readings will likely be updated as the semester progresses.

Software

We will use Microsoft Excel and Stata extensively throughout the semester. Most of the problem sets, class activities, and your final report will involve using either Microsoft Excel or Stata. I assume that you have already had Microsoft Excel installed on your computer. Stata is installed on any computers in university’s labs and library. If you want to work with Stata on your own computer you may purchase the student version as cheap as $38 for a six-month license Small Stata version (http://www.Stata.com/order/new/edu/gradplans/student-pricing/). This version is sufficient for this course.

Stata is a widely used statistical software by faculty in our school. Having knowledge and programming skills in Stata or other statistical softwares (e.g. SAS, R, and SPSS) will give you a great advantage in the job market. I will not teach you how to do statistical programming in this course but I will help you using Stata’s basic functions to do statistical analyses. If you think you need to learn Stata programming, I strongly recommend RPAD 688.

Grading and Assignments

In this course, you will learn statistical methods, how to manipulate data and compute statistics using software package. You will also gain skills to interpret statistical analyses and communicate results to both technical and non-technical audience. You will demonstrate these abilities through quizzes, problem sets, a final report, and exams.

- Weekly reading quizzes (15%)

Every week, there will be a quiz that will be taken at the beginning of the class. The goals of these quizzes are to encourage you to do the readings and come to class prepared. You will first take these quizzes individually and then as a group. First, you will need to work individually to answer the questions. Then you will be working as groups to discuss the best groups’ answers. Your individual score will account for 75% and your group score 25% of the total score for each individual quiz grade. I will drop the three lowest quiz grades. This includes zeros that you might receive for an unexcused absence from class or coming to class too late. *There will be eleven quizzes during the semester.*

- Participation (5%).

Active participation in in-class discussion and in group activity is beneficial for our learning process. You are expected to attend each class on a timely basis, so that each of us will benefit from the learning process during the class. Consistent tardiness and unexcused absences will result in a reduced final participation grade. Speak with me at the beginning of the semester if you anticipate time conflicts related to professional obligations.

- Problem sets (20%).

Problem sets consist of a mix of written answers, manual computations, and computational works or analyses using statistical software package. You will need to write the final homework submission by your own works. You need to mention your colleagues’ name whom you worked with. *There will be eleven problem sets throughout the semester.* Hard copies of all problem sets are due at the START of class. I will drop 1 (one) of the lowest problem set submissions.
• Exams (40%).

There will be mid-term and final exams (20% each) throughout the semester. The exams will ask you to work problems and answer questions that build on problem sets and in-class materials. Exams are in-class and close-book. You are only allowed to bring a flash card size (single sided) note card to the exams and a calculator.

• Final report (20%).

The final report allows you to demonstrate what you have learned during the course to conduct basic statistical analysis on topics of your interest. You will need to submit a brief proposal before the mid-term that I will review and approve to make sure that you have feasible research questions. You need to state your research topic, research question(s), why do you think it is important, and the data source you are going to use. A detail instruction will be distributed later. In the last class meeting, each student will present his/her work. A detail instruction of final report presentation will be distributed later in the semester. You are encouraged to work through the methods with other students, but you must run your analysis and write your own report.

Each assignment will receive a letter grade. To calculate your semester grade, I will convert the final grade to a 4-pt scale (A = 4.0, A- = 3.66, B+ = 3.33, etc.). I will then take a weighted average of all your assignments to get your semester score. The score will be converted into a final letter grade with the following thresholds: A: 3.7 or higher; A- : 3.55 to 3.69; B+: 3.2 to 3.54; B: 3.0 to 3.19; B- : 2.60 to 2.99; C+ : 2.25 to 2.59.
## Summary Course Schedule

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<td>5-May</td>
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Detail Course Schedule

WEEK 1: Introduction

Review topics:
- Review course syllabus - plan your time to meet the requirements of this course
- Why should we care about statistics?

Computer Exercise
- Introduction to Statistical Software package
- Software installation
- Familiarizing with software interface and basic command/function

Reading Assignments:
- Textbook Ch. - 1 : Statistics and Public and Nonprofit Administration

WEEK 2: Measurement

Review topics:
- Why and how to specify variables to operational concepts of given social phenomena
- Types of measurement
- Measurement reliability and validity
- Level of measurement

Computer Exercise
- Working with variables: Create and manipulate variables

Reading Assignments:
- Textbook Ch. 2 – Measurement
- Textbook Ch. 24 – Performance Measurement Techniques

WEEK 3: Causal Explanation and Research Design

Review topics:
- Concept, conceptual definition, and an operational definition
- Hypothesize a relationship and write a hypothesis related to a given theory
- Correlation/association vs. causation

Computer Exercise
- Working with variables: Create and manipulate variables (cont.)

Reading Assignments:
- Textbook, Chap 3 : Research Design
WEEK 4: Descriptive Statistics

Review topics:
- How to summarize data and interpret graphic and numeric summaries of data
- Measures of central tendency and dispersion
- Frequency distribution

Computer Exercise
- Obtaining summary statistics
- Graphical data visualization (histogram,

Reading Assignments:
- Textbook Ch. 4 - Frequency Distributions;
- Textbook Ch. 5 - Measures of Central Tendency
- Textbook Ch. 6 - Measures of Dispersion

WEEK 5: The Normal Distribution & Sampling

Review topics:
- Characteristics of the normal distribution
- Z-scores (when to use and how to calculate it)
- Different Sampling strategies

Computer Exercise
- Calculate z-Scores for given data

Reading Assignments:
- Textbook Ch. 7, The Normal Probability Distribution

WEEK 6: Estimating Population Parameters

Review topics:
- The relationships among sample, statistic, population, parameter, and the sampling distribution.
- Confidence interval.
- Standard error
- Central Limit Theorem

Computer Exercise
- Using sampling weights

Reading Assignments:
- Textbook Ch. 11 - Introduction to Inference;
- Textbook Ch. 12 - Hypothesis Testing p. 201-203 ("Determining Sample Size")
- Textbook Ch. 13 - Estimating Population Proportions
WEEK 7: Hypothesis Testing

Review topics:
- Factors influencing the probability of rejecting the null hypothesis.
- Write the null and alternative hypotheses and calculate the appropriate test statistic
- Interpret significance
- Type I vs Type II errors

Computer Exercise
- Performing hypothesis testing

Reading Assignments:
- Textbook Ch. 12 - Hypothesis Testing

WEEK 8: Mid term

WEEK 9: Contingency Tables

Review topics:
- Percentage distributions vs contingency table
- Calculate and interpret percentage distributions for nominal and ordinal variables
- Construct and interpret a contingency table that displays the association between two categorical (nominal and/or ordinal) variables.

Computer Exercise
- How to calculate percentage distributions and create a contingency tables

Reading Assignments:
- Textbook Ch. 15 - Construction and Analysis of Contingency Tables

WEEK 10: Testing the Difference between Groups & Counts

Review topics:
- Test for significant association between a dichotomous (nominal) variable and a quantitative variable, and between two categorical variables

Computer Exercise
- Performing tests for association between a dichotomous (nominal) variable and a quantitative variable, and between two categorical variables

Reading Assignments:
- Textbook Ch. 14 - Testing the Difference between Groups;
- Textbook Ch. 16 - Aids for the Interpretation of Contingency Tables
WEEK 11: Introduction to Regression Analysis

Review topics:
- Underlying logic of regression analysis
- How to interpret the constant and the coefficient
- Assumption of linear regression

Computer Exercise
- Creating scatterplots

Reading Assignments:
- Textbook Ch. 17 - Statistical Control Table Analysis;
- Textbook Ch. 18 - Introduction to Regression Analysis
- Textbook Ch. 19 – The Assumptions of Linear Regression

WEEK 12: Multiple Regression

Review topics:
- How to interpret the constant and the coefficient of given multivariate regression
- Significance test for a coefficient
- Measure of goodness of fit

Computer Exercise
- Running linear regression model
- Obtaining and storing regression results

Reading Assignments:
- Textbook Ch. 21 – Multiple Regression;
- Textbook Ch. 23 – Regression Output and Data Management

WEEK 13: Extension of Multiple Regression

Review topics:
- Non-linear regression models
- Interpreting constant and coefficients from non-linear regression models

Computer Exercise
- Running non-linear regression model

Reading Assignments:
- TBA
Other policies

- Academic integrity

As a future administrator or manager of public and non-profit organizations, you need to maintain your integrity along your career road. Therefore, any form of academic dishonesty will not be tolerated and you will need to stay away from these misconducts. If you are uncertain about academic dishonesty and misconduct, please refer to University at Albany’s Academic Code at: http://www.albany.edu/content_images/AcademicIntegrity.pdf for the definition of academic dishonesty. It is University at Albany’s policy that ignorance of these policies will not excuse dishonest conduct. Violations of these standards will result in one of the following penalties or some variant: reduction in the grade for the assignment, failure of the assignment, failure of the course, or expulsion. In all cases, a Violation of Academic Integrity Report will be submitted to the Dean of Graduate Studies to be placed in your university file, with copies provided to you, the department head, and the Dean of Rockefeller College. You might think that it is acceptable to seek problem sets, answers to problem sets, past exams, or past exam answers from any previous student without written permission in order to help you to complete the assignment. However, these actions are serious academic misconduct by both the current and past student will be treated in accordance to university’s policy.

- Appeal

Student may appeal a grade on a specific assignment within two weeks of the assignment being returned. To submit an appeal, the student should return the original graded assignment and a letter/memo outlining why you think the grade should be changed. Appeals must be submitted on paper, typed-written. In the appeal, students must identify: 1) the specific issue you believe should be reconsidered, and 2) evidence from assignment instructions, assigned readings, lectures, or other materials that would indicate your original submission is worthy of a higher grade. You should be aware that your grade may go up, down, or remain the same as a result of your appeal.

- Students with special needs
Students with needs consistent with the Americans with Disability Act should inform the instructor during the first week of class so that reasonable accommodations can be made. Please refer to Disability Resource Center (http://www.albany.edu/disability/) for more information.

- Medical excuses

In the case of medical emergency that prevent you from attending class meetings, submitting assignments on time, or attending exams, excuses may be granted in case-by-case and need to be accompanied by medical excuses from the Student Health Services. Please refer to Medical Excuse Policy (http://www.albany.edu/health_center/medicalexcuse.shtml) for more information.

- Use of cellphones, tablets, and computers.

We want to create a safe and stimulating learning environment in the class. Inappropriate use of cellphones often undermine this. Please restrain yourself from using your cellphones or tablets for unrelated activities. Cellphones should only be used in case of emergencies. You can use computer, laptop or tablets only for notes-taking, reading class materials, or doing in-class exercise.