

Rutgers University – Newark
School of Public affairs and Administration

20:834:561:01: APPLIED STATISTICS

Fall 2014

Instructor: Dr. Qiushi Wang

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Classroom: ENG-215

Office hours: Thursday 2:00-4:30 p.m. or by appointment

Thursday: 5:30 p.m.-8:10 p.m.

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Course Objectives: The purpose of this course is threefold. The first is to familiarize the student with the basics of social science research design and the first two classes the course will be dedicated to this purpose. A good research design enables us to verify the validity of a theory and is crucial to the development of knowledge. It is my hope to provide you with the ability to understand and think critically about the difficult problems that you encounter in your professional career. It is assumed that many of you have already taken or will soon take the Research Design course, so this class will only cover the contents that are directly linked to statistics and serve as a quick review of key concepts. Second and the main goal of course is to introduce you the theoretical foundation of statistical analysis. As a modern administrator, an insightful policy analyst or a good researcher, student must learn to become an intelligent consumer and producer of empirical research as applied to public administration. If you do not understand the statistical analysis and the methodology involved in administrative practices, you will have very limited ability to read research results from the professional literature and convey them to your audience. Third, this course is also designed to develop students' skills in spreadsheet and popular statistical software such as SPSS and STATA. Over the course of the semester, we will use these computer programs intensively. All students are required to employ these techniques learned in class to work on their exercises and exams.

Course Evaluation: Previous background in quantitative methods is NOT assumed for this course, but some knowledge in algebra, statistics and skills in computer would be helpful. Evaluations will be based on take-home exercises, one mid-term and one final exam. See the table below for a detailed breakdown. The take-home exercises are reviews of what is covered in class and they also provide students with an opportunity to have some hands-on experience in dealing with data. Please turn in your exercises on time and late assignments will be penalized. The midterm and final exams are in class and closed-book. Cheating will result in an "F" grade. Make-up exams and exercises can create serious equity problems and will not be allowed except under the most compelling circumstances, and only if the instructor approves a written request by the student before the examination.

Elements	Percentage of Grade
Exercises	40%
Mid-term	30%
Final Exam	30%
Total	100%

Grades will be assigned on a strict percentage basis. The percentages that correspond to each grade are listed below.

A	90%
B+	85%
B	80%
C+	70%
C	60%
F	59% and below

Course Communication: PowerPoint slides will be used during lectures throughout the course. Electronic copies of these, and other essential course materials, are posted on the class Blackboard site, where they may be downloaded and printed. Check your Blackboard account regularly for course documents and announcements. Please also check your emails frequently, in case the instructor needs to reach you.

Class Policies: It is the student's responsibility to take appropriate measures to ensure they keep up with the material. Students should feel free to contact the instructor for help as needed. I am glad to talk with you at mutually convenient times; please contact me if you would like to talk. Please inform me in advance if any of the dates on the class schedule conflict with your religious observances.

Academic Honesty and Integrity: Students are responsible for informing themselves about the standards of academic integrity before performing any academic work. The link to Rutgers University's "Policy on Academic Integrity for Undergraduate and Graduate Students" can be found at <http://academicintegrity.rutgers.edu/integrity.shtml>. Evidence of dishonesty will be dealt with severely, and will result in a failing grade for that assignment, without exception.

Books: One textbook is required for this class and they are available in the RU bookstore or online places such as Amazon or Ebay:

- Agresti, A., & Finlay, B. (2007). *Statistical methods for the social sciences* (4th ed.). Upper

Saddle River, NJ: Prentice Hall.

Computer requirement: Students MUST have a laptop equipped with Excel program (preferably of 2003 version or later) and be able to bring it to classroom. Mac users may install 'Statplus', which is available from Blackboard. Tablets are not good for this class.

Class notes, assignments, other related materials and announcements are posted on the blackboard. Students should check this site regularly. Some other books that may be helpful are listed below for your reference:

- de Vaus, D. (2001). *Research design in social research*. Thousand Oaks, CA: Sage Publications.
- Gujarati, D.N. (1995). *Basic econometrics* (3rd ed.). New York: McGraw-Hill College.
- Berg, B. L. (2003). *Qualitative research methods for the social sciences* (5th ed.). Upper Saddle River, NJ: Prentice Hall
- Creswell, J.W. (2002). *Research design: Qualitative, quantitative, and mixed method approaches*. Thousand Oaks, CA: Sage Publications.
- Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. Hoboken, NJ: John Wiley & Sons Inc.
- Trochim, M.K. *Research methods knowledge base*. Available at www.socialresearchmethods.net/kb/
- Freedman, D., Pisani, R., & Purves, R. (2007). *Statistics*. New York: W W Norton & Co Inc.
- *Wooldridge, J.M. (2005) *Introductory econometrics: A modern approach*. Mason, OH: Thomson South-Western.

Starred (*...) readings are more advanced.

Dates and Topics

Note: Readings with * are optional. Other resources and readings may be added at my discretion.

September 4: Course Overview and Intro to Research Design

September 11: Basics of Research Design

- de Vaus, Chs. 1-3

September 18: Measurement & Sampling

- Agresti & Finlay, Chs. 1-2

September 25: Descriptive Statistics and Excel

- Agresti & Finlay, Chs. 3

-*Freedman, Chs. 13-18

October 2: No class. (Out of town for conference)

October 9: Probability Theory

- Agresti & Finlay, Chs. 4

-*Freedman, Chs. 3-7

-*Gujarati, Appendix A

October 16: Measures of Association

- Agresti & Finlay, Chs. 7-8

-*Freedman, Chs. 8-12

October 23: Statistical Inference: Estimation

- Agresti & Finlay, Chs. 5

-*Gujarati, Chs. 5

-*Wooldridge, Chs.3

October 30: Midterm Exam

November 6: Statistical Inference: Hypothesis Testing

- Agresti & Finlay, Chs. 6

-*Gujarati, Chs. 5

-*Wooldridge, Chs.4

November 13: Linear Regression-Univariate

- Agresti & Finlay, Chs. 9

-*Gujarati, Chs. 2-3

-*Wooldridge, Chs.2

November 20: Linear Regression-Multivariate

- Agresti & Finlay, Chs. 10-11

-*Gujarati, Chs. 7-8

November 25(Tuesday!): ANOVA

- Agresti & Finlay, Chs. 12-13

-*Gujarati, Chs. 7-8

November 27: No class. Thanksgiving.

December 4: Regression Diagnostics and Model Building

- Agresti & Finlay, Chs. 14

-*Gujarati, Chs. 13-14

-*Wooldridge, Chs.6,8

December 11: Logistic Regression and Other Advanced Methods

- Agresti & Finlay, Chs. 15-16

-*Gujarati, Chs. 16

-*Wooldridge, Chs.7

December 18: Final Exam