

PUBLIC POLICY 529: STATISTICS

University of Michigan

Winter 2015

Instructor: Prof. Catie Hausman
Office Hours: Monday 1:30 – 3:30; or by appointment

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Graduate Student Instructor: Alison Carey
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Office: to be determined
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Lecture Time/Location: Monday and Wednesday, 10 – 11:30 am, 1120 Weill Hall

Discussion Time/Location: Friday, 10 – 11:30 am, 1120 Weill Hall

COURSE DESCRIPTION

This course is an introduction to statistics and their application in public policy and social science research. It consists of two weekly class sessions in addition to a discussion section. The discussion section will be used to cover problems encountered in the lectures and written assignments, as well as to develop statistical computing skills. Throughout the term we will be covering issues related to data collection (including surveys, sampling, and weighted data), data description (graphical and numerical techniques for summarizing data), probability and probability distributions, confidence intervals, hypothesis testing, measures of association, and analysis of variance. The course assumes no prior knowledge of statistics and no mathematical knowledge beyond calculus.

You must be a Ford School student to enroll in this course.

MATERIALS

Textbooks:

All textbooks are available at the university bookstores. Both books are available for purchase or to be rented.

- 1.) *Statistical Methods for the Social Sciences* (4th Edition) by Alan Agresti and Barbara Finlay
- This will be the primary text used throughout the course. Purchase of the book is required.
- 2.) *A Gentle Introduction to Stata* by Alan C. Acock
- This is an optional supplemental textbook. It provides very helpful guidance with Stata, the statistical package we will be using throughout the course.

Calculator:

Access to a calculator is strongly recommended. You will not require a calculator with graphing capabilities.

Clickers:

We will use i>clickers during class to take attendance, facilitate discussion, and provide feedback about your understanding of the material. This is the first time these will be used, so please forgive any technical glitches. You can purchase one from the UofM Computer Showcase in Michigan Union or North Campus for \$28 (used) or \$38 (new).

Computer Software:

We will be introducing the Stata software package at the beginning of the semester and using it on assignments throughout the term. Stata is available on computers in the Ford School computer lab, but may not be available in all computer labs on campus (typically it is available in the larger labs on central campus).

GRADING

The final grade will be calculated as follows:

First quiz (February 2)	10%
Midterm exam (February 25)	25%
Second quiz (March 30)	10%
Final exam (April 29)	25%
Problem sets	25%
Attendance (in the form of a non-graded daily quiz)	5%

Problem Sets

All problem sets will be posted on the course website and are due at the start of the class specified on the course schedule. Problem sets received after class will receive no credit. Problem sets placed in mailboxes or sent via email will not be accepted unless arranged with the instructor or GSI.

Requests for re-grades will be honored, but the entire problem set will be re-graded by the instructor. Consequently, the re-graded score may be lower than, equal to, or higher than the original score.

Exams

There will be two quizzes and two exams. They will test material covered in lectures, assigned readings, problem sets, and in-class discussion. Students can reference a calculator and a formula sheet. The formula sheet will be provided by the instructor.

Attendance

Every lecture there will be a one-question “attendance quiz,” which I will use to take attendance. You do NOT need to get the question right – you simply need to turn it in.

Attendance at discussion section is not mandatory.

STUDENTS WITH DISABILITIES

If you believe you need an accommodation for a disability, please let us know at your earliest convenience. Some aspects of this course may be modified to facilitate your participation and progress. As soon as you make us aware of your needs, we can work with the Office of Services for Students with Disabilities to help us determine appropriate accommodations. We will treat any information you provide as private and confidential.

COURSE SCHEDULE

NOTE: Below is a tentative lecture schedule; topics may vary depending on the pace of lectures.

Wednesday, Jan. 7: Introduction

Monday, Jan. 12: Overview of course; Introduction to Stata; Sampling and measurement

Wednesday, Jan. 14: Descriptive statistics

Reading: A&F, Chapters 1, 2 & 3

Monday, Jan. 19: NO CLASS (Martin Luther King, Jr. Day)

Wednesday, Jan. 21: Descriptive statistics

Reading: A&F, Chapter 3

* Problem Set 1 Due

Friday, Jan. 23

Monday, Jan. 26: Probability theory

Wednesday, Jan. 28: Probability theory

Reading: Optional readings to be posted on CTools

* Problem Set 2 Due

Friday, Jan. 30

Monday, Feb. 2: ~~QUIZ; Probability theory~~ SNOWSTORM

Wednesday, Feb. 4: ~~Probability distributions~~ QUIZ; Probability theory

Reading: A&F, Chapter 4

[D.C. Trip]

* Problem Set 3 Due

~~Friday, Feb. 6~~ Wednesday, Feb. 11

Monday, Feb. 9: Probability theory and probability distributions

Wednesday, Feb. 11: Probability distributions and sampling distributions

* Problem Set 4 Due

~~Friday, Feb. 13~~ Monday, Feb. 16

Monday, Feb. 16: Sampling distributions

Wednesday, Feb. 18: Statistical inference (Estimation)

Reading: A&F, Chapter 5

~~* Problem Set 5 Due~~

~~Friday, Feb. 20~~

Monday, Feb. 23: Statistical inference (Estimation) and Review for midterm exam

Wednesday, Feb. 25: MIDTERM EXAM

NO CLASS: WINTER BREAK

Monday, Mar. 9: Go over midterm; Statistical inference (Estimation)
Wednesday, Mar. 11: Statistical inference (Significance tests)
Reading: A&F, Chapter 6

* Problem Set 5 Due
Monday, Mar. 9

Monday, Mar. 16: Statistical inference (Significance tests)
Wednesday, Mar. 18: Statistical inference (Significance tests)
Reading: A&F, Chapter 6

Monday, Mar. 23: Statistical inference (Significance tests)
Wednesday, Mar. 25: Comparison of two groups
Reading: A&F, Chapter 7

* Problem Set 6 Due
Monday, Mar. 23

Monday, Mar. 30: QUIZ; Catch-up
Wednesday, Apr. 1: Comparison of two groups
Reading: A&F, Chapter 7

Monday, Apr. 6: Chi-squared test of independence
Wednesday, Apr. 8: Correlation coefficient
Reading: A&F, Chapter 8: pages 221 – 229 ONLY
Reading: A&F, Chapter 9 OPTIONAL – we will not cover regression

* Problem Set 7 Due
Monday, Apr. 6

Monday, Apr. 13: ANOVA
Wednesday, Apr. 15: Causation versus correlation
Reading: A&F, Chapter 12, pages 369 – 378, 382 – 386 ONLY
Reading: A&F, Chapter 10 OPTIONAL

Monday, Apr. 20: Putting the pieces together and review

* Problem Set 8 Due
Monday, Apr. 20

Wednesday, Apr. 29: FINAL EXAM, 4 – 6 p.m.