

RUTGERS UNIVERSITY
Bloustein School of Planning and Public Policy

Spring 2009
Course: 762:205:01:31625 Basic Statistical Methods

Class Meetings: FH B5, Tuesdays 1:10-3:25 and Thursdays 1:10-2:30

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Description and Goals:

This is a basic course in statistics with the goal of laying the foundations for students to develop abilities to:

- ❖ read professional public health, urban studies and public policy literature with an appreciation for both its substantive contribution and use of statistical tools; and
- ❖ apply basic statistical techniques in the course of higher studies or professional work.

Students will be introduced to the basic concepts of collecting, organizing and describing data. In addition, students will learn the fundamental concepts of probability and sampling theory that provide the tools for inferring population characteristics based on small amounts of data (samples). Specific topics include descriptive and inferential statistics, sampling methods, probability, estimation, hypothesis testing, correlation and linear regression, and chi square.

Requirements:

- ❖ Regular attendance and participation in lectures
- ❖ Weekly quizzes every Tuesday starting on January 27, 2009
- ❖ Two cumulative midterm exams and a cumulative final exam
- ❖ Use the Sakai site for this course: <https://sakai.rutgers.edu/portal>

Grading:

The final grade will be computed as follows:

Quizzes (approximately 6, drop lowest 2)	25 percent
2 Midterms (25 percent each)	50 percent
Final Exam	25 percent
Attendance and Class Participation	Resolves close calls

There will be **NO MAKEUP** quizzes, midterms or final exam.

Text Book:

Mendenhall, Beaver, & Beaver, *Probability and Statistics*, 12th Edition.
Murray R. Spiegel, *Statistics Crash Course*, Schaum's Easy Outlines, 2000 (optional)

Academic Integrity:

All members of our community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain advantage not given to all students is dishonest, whether or not the effort is successful. A violation of academic honesty is a breach of trust, and will result in penalties, including possible suspension or expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructors. Please see: <http://academicintegrity.rutgers.edu/students.shtml> for further information.

Course Outline:

Week 1: January 19
Introduction, branches of statistics, population and sample.
Read: Introduction and Chapter 1

Week 2: January 26
The research process, variables, variable measurement, research design, data collection methods.
Read: Chapter 2

Week 3: February 2
Tabular and graphical description and summarization of data – frequency distributions, pie charts, bar graph, histograms, stem and leaf plots, time series plots.
Read: Chapter 3

Week 4: February 9
Numerical description and summarization of data – measures of central tendency and variability
Read: Chapter 4 (but not Sections 4.4 and 4.7)

Week 5: February 16
Continue measures of variability, the empirical rule, description and summarization of relationship between two variables
Read: Chapter 4 (but not Sections 4.4 and 4.7)

Week 6: February 23
Probability – introduction, random variables, binomial distribution, normal distribution.
Read Chapter 5.

Week 7: March 2
Continue normal distribution, sampling distribution of the mean.
Review for midterm I (no material after March 5 on midterm I)

Week 8: March 9

Continue sampling distribution of the mean, central limit theorem, sampling distribution of sample proportion, normal approximation to binomial.

Read: Chapter 7

Midterm Exam I, March 12: covering Introduction, Chapters 1, 2, 3, 4 and Lecture Notes

Read: Chapter 6

SRPING BREAK: Week of March 16

Week 9: March 23

Inferential Statistics – Parameter estimation – point estimation and interval estimation for a single population mean, a single population proportion, t-distribution.

Read Chapter 8

Week 10: March 30

Interval estimates for two independent population means, two non-independent population means, two independent population proportions.

Read: Chapter 8

Week 11: April 6

Hypothesis Testing – overview, hypothesis testing for a single population mean.

Midterm Exam II, April 9: covering Chapters 4, 5, 6, 7, and Lecture Notes

Read: Chapter 9

Week 13: April 13

Continue hypothesis testing - one and two tailed hypothesis tests, Type I and Type II errors, hypothesis tests for single population proportion, two independent population means, two non-independent population means.

Read: Chapter 14

Week 14: April 20

Finish up hypothesis testing, introduction to Chi-Square goodness of fit test.

Read: Chapter 12.1 – 12.3

Week 15: April 27

Chi-square test of independence, introduction to regression and correlation.

Week 16: Last Class meeting on April 30

Review and course evaluations

Final Exam: During Exam Week This exam will cover all of the material in the course, however it will concentrate on Chapters 8, 9, 12, 14 and Lecture Notes

Practice Problems (numbers listed below are problem numbers not page numbers)

1.39	1.41	1.45						
2.1	2.3	2.5	2.13	2.19	2.42			
3.11								
4.1	4.5	4.42	4.43	4.47	4.51	4.83	4.85	4.88

5.3	5.7					
6.3	6.5	6.7	6.13	6.17	6.37	6.39
7.5	7.19	7.23	7.33			
8.3	8.5	8.23	8.25	8.39	8.41	8.51
9.3	9.6	9.7				
10.1	10.3	10.5				