

**NEW YORK UNIVERSITY STEINHARDT SCHOOL OF EDUCATION**  
THE DEPARTMENT OF TEACHING AND LEARNING

**E 12.2032 Teaching Data Collection and Analysis**  
**Fall 2010**

**Instructor:** Judith Green  
**Days and Time:** Thursdays, 4:55 p.m. to 6:35 p.m.  
**Course Location:** 35 West 4 C17  
**Office Hours:** Tuesday, 1:00-3:00pm  
Wednesday 1:00-3:00pm  
Thursday 2:00 – 4:00pm or by appointment

**Course Description:**

This course focuses on the pedagogy associated with fundamental concepts of data collection and analysis as well as probability and statistics taught in secondary mathematics. These include measures of central tendency, correlations, regression, display of data and the underlying probability theory. Participants will examine common misconceptions, issues of particular difficulty in teaching probability, instructional strategies and common technology used in teaching these topics.

**Course Objectives:**

- To examine basic probability as an underlying concept in statistics
- To understand issues surrounding the exploration of data
- To develop strategies to combat frequent misconceptions in probability and statistics
- To explore and adapt technology used in teaching data collection and analysis
- To develop strategies and techniques in teaching modeling and problem solving in data analysis
- To develop appropriate communication strategies around data exploration

**Course and Requirements**

This course will use the NCTM content standards of Data Analysis, Number and Operation and Measurement as a basis for topic exploration. The pedagogy will focus on NCTM content standards and those concepts that are prerequisite for student instruction and understanding. We will also explore the content with regard to instructional and assessment choices and communication issues connected to classroom implementation.

All assignments and reading reviews should be completed with a connection to and discussion about the instructional implications. All written submissions should be

typewritten and double-spaced using a 12-point font and references should be included as needed.

Homework and reading assignments will be posted on Blackboard or distributed in class. Readings are taken from selected publications including NCTM, ASA and MAA journals. All items are due at the class session following the assignment unless otherwise noted.

**Course Text:**

1. Ash, Robert B. (2008) **Basic Probability Theory**. New York, Dover.
2. Bulmer, M.G. (1967, 1979) **Principles of Statistics**. New York, Dover  
Gordon, Florence.

**Additional Resources:**

3. [http://www.causeweb.org/wiki/chance/index.php/Main\\_Page](http://www.causeweb.org/wiki/chance/index.php/Main_Page)
4. Shaughnessy, Michael J., Chance, Beth, Kranendonk, Henry (2009) **Focus in High School Mathematics: Statistics and Probability**. Reston, NCTM.
5. Shaughnessy, Michael J., Chance, Beth (2005) **Statistical Questions from the Classroom**. Reston, NCTM

**Grading:**

- 35% Unit Plan and Presentation On Selected topic
- 25% Homework
- 20% Participation and Attendance
- 20% Final Exam

**Session Topics- Subject to Change**

1. Course introduction, Concept of probability, Sample space
2. Law of Large Numbers, Conditional probability, independent events, Bayes' theorem, Birthday Problem
3. Tree diagram, permutations, combinations, binomial coefficient
4. Geometric probabilities, Buffon's Needle
5. Measures of central tendency, measures of dispersion, percentiles
6. Data- type, collection-sample-experiment, analysis, error
7. Mathematical expectation, variants and standard deviation
8. Displays of Data, Plots, Histograms, Technology
9. Confidence interval, tests of significance, chi sq
10. Random variables, probability distribution, distribution functions
11. Data analysis and Assessment
12. Teaching through Statistics/Unit Planning
13. Student Presentations
14. Final Exam- Due December 22, 2010