CENTRAL CONNECTICUT STATE UNIVERSITY
Teaching Probability and Statistics in the Elementary Grades
MATH 508/538

Instructor: Shelly M. Jones, Ph.D.
Office: Maria Sanford 312
Section: Monday 4:30 – 7:10 PM
Term: Spring 2006

Office Hours:
Location: MS 214
Monday & Wednesday 3:00 – 4:30 PM
Credit: 3- graduate
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Catalog Description: This course will focus on the development of probability and statistics.

Prerequisite: Math 113, and Math 213, and Math 412 or Math 531 or equivalent.

Students for Whom this Course is Intended: Students enrolled in the MS Program in Mathematics specializing in Elementary Mathematics.

Principles to Actions, NCTM

Important Website Resource: www.Illustrativemathematics.org. We will use lessons from the Illustrative Mathematics website during classtime. We will engage with the lessons, discuss the important aspects of the lesson as they pertain to the CCSSM Content and Practice Standards. We will also use the Principles to Action textbook to discuss the Teaching Principles as they are related to the selected lessons.

Basic Goals of the Course: To acquaint students with methods and practices that are aligned with the CT Core Mathematics Content Standards related to the teaching of probability and statistics concepts. An in depth focus on the “big ideas” in probability and statistics in the elementary/middle grades will be presented.

Some Topics to be Considered:

A. Analyzing characteristics, properties, and applications of statistical data
   • Pose questions and gather data using observations, surveys, and experiments
• Sort and classify objects according to their attributes and organize data about the objects
• Describe parts of the data and the set of data as a whole to determine what the data show
• Design investigations to address a question and consider how data collection methods affect the nature of the data set
• Recognize the difference in representing categorical and numerical data
• Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set
• Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions

B. Organizing data into graphs, and interpreting graphs for important data
• Represent data using concrete objects, pictures, graphs such as line plots, bar graphs, and line graphs
• Describe the shape and important features of a set of data and compare related data sets with emphasis on how the data are distributed
• Compare different representations of the same data and evaluate how well each representation shows important aspects of the data

C. Identifying probabilities of events related to students’ experiences
• Describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible
• Predict the probabilities of outcomes of simple experiments and test the predictions
• Understand that the measure of the likelihood of an event can be represented by a number from 0 to 1

This course examines the methods and procedures in teaching mathematics at the elementary and middle school levels. Course content will be presented using practices that are aligned with the National Council of Teachers of Mathematics Principles and Standards and the CT Core Standards which are closely aligned to the Common Core State Standards.

Attendance:
You are expected to attend all class meetings and to participate in all class workshops and discussions. All reading assignments MUST be completed prior to the appropriate class. Please bring your textbooks and journal to class. In the unlikely event that you are unable to attend a class session, please email me or call my office phone and leave a message explaining your absence. It is your responsibility to obtain homework and journal assignments in the event of an absence.
Assessment:

A. Attendance and Class Participation (20%)

B. Midterm Exam and Final Project: These assessments will test your understanding of mathematical concepts and methods for teaching those concepts (45%)

C. Topic Papers. You will be assigned various papers to write about your knowledge of Technology, Standards, and Assessment. Each paper should be two double-spaced typed pages (10%)

D. Reflective Journal: After each class you will summarize for yourself what you learned during that day. You will keep this in a professional reflective journal on your computer. This reflective journal is not simply a restatement of your notes. You need to reflect on this journal in terms of how you understand the mathematics as result of today’s class. Do not put off writing in your journal for several days. Do it as soon as you possibly can—the best thing to do is to write your journal on the same day as class. At the end of the semester you will submit a reflection for the course (5%)

E. Statistics & Probability Presentations (20%):
   a. Teach a Lesson
   b. Present on your Project
   c. Choose Stats for one of your presentations and Probability for the other

University Policies:

A. You must take the final examination at the time specified in the course selection book

B. If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. My office telephone number and office hours are given above.

C. In the event of a weather emergency which requires curtailment or cancellation of classes, listen to WTIC (1080 AM) or call (860) 832-3333 for the “general snow message.”

D. Last day to drop a course is April 20, 2020. Forms are available in the Enrollment Center, Willard Hall. Cessation of attendance, notice to the instructor, or telephone calls to the Enrollment Center are not considered official notice of a student’s intention to drop the course.
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<tr>
<th>Week</th>
<th>Topic</th>
<th>Homework Assignment</th>
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| January 27 | **Introductions & Syllabus**  
Data Displays:  
Human Box and Whisker Plot Whole Class Activity  
Gr. 6 CCSS: Variability and Distributions | For our next session: Bring data to class that you want to graph. (District Data, data from a website or newspaper, survey responses, etc.) |
| February 3 | **Measures of Center** (Groups do posters then Gallery Walk)  
Decision Making with Data  
Height vs Arm Span Activity |                                                                                     |
| February 10| **Gr. 7 CCSS:** Random sampling to draw inferences about a population; Draw informal comparative inferences about two populations |                                                                                     |
| February 17| **PRESIDENTS DAY**                                                    |                                                                                     |
| February 24| **Gr. 7 CCSS:** Investigate chance processes and develop, use, and evaluate probability model |                                                                                     |
| March 2    | **Gr. 8 CCSS:** Investigate patterns of association in bivariate data |                                                                                     |
| March 9    | **Finish any content still needed and review for midterm as needed**  |                                                                                     |
| March 16   | **SPRING BREAK – NO CLASS**                                           |                                                                                     |
| March 23   | **MIDTERM EXAM**                                                      | Standards Paper Due                                                                |
| March 30   | **NO CLASS – NCTM ANNUAL CONFERENCE**                                 | Technology Paper Due                                                                |
| April 6    | **Statistics Lesson Presentations:**  
Using Computer Software and Graphing Calculator Technology | Bring to our next class, an example of any district data that you’ve analyzed with your fellow math teachers – Bring 4 copies please! |
| April 13   | **Statistics Lesson Presentations**  
Analyzing District Data |                                                                                     |
| April 20   | **Probability Lesson Presentations**                                 |                                                                                     |
| April 27   | **Probability Lesson Presentations**                                 |                                                                                     |
| May 4      | **Consultations for projects**                                       | Reflective Journal Due                                                              |
| May 11     | **Final Projects Due**                                               |                                                                                     |