

# University of West Georgia

## Course Syllabus Probability & Statistics for P-8 Teachers (MATH 4713) Fall 2015

Instructor: M. Yazdani, Ph.D.

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Conference Hours:

Tuesday

8:00-9:30; 12:30-3:30; 5:00-5:30

By Appointment

Thursday

8:00-9:30; 12:30-3:30; 5:00-5:30

By Appointment

### Text:

Billstein, R., Libeskind, S., Lott, J., (2013) A Problem Solving Approach to Mathematics for Elementary School Teacher, Eleventh Edition, Pearson, Boston, MA.

**Catalog Description:** Special emphasis for teachers of grades P-8. Broadens understanding of fundamental concepts of probability and statistics with particular attention to specific methods and material of instruction.

**Instructor's emphasis:** This research-based course provides the conceptual framework for increased understanding and application of rational numbers, probability, and statistics. Communicating concepts, processes or solutions effectively, in oral and written forms, will be emphasized.

### Student Learning Outcomes

**After completion of the course, the student will:**

#### Probability

1. Describe and compute the outcome of simple and compound events
2. Explore concepts of probability through simulations
3. Create, use and interpret tree diagrams for simple, conditional and joint probabilities
4. Compute odds and convert to/from probabilities
5. Compute permutations and combinations for real-world scenarios

#### Statistical graphs

1. Investigate and answer questions by collecting, organizing and displaying data from real-world situations
2. Support arguments, make predictions and draw conclusions using summary statistics and graphs to analyze and interpret one-variable data
3. Communicate the results of a statistical investigation using appropriate language
4. Create and interpret graphs (pie graph, pictograph, bar graph, histogram, line plot, line graph, map chart, frequency polygon, stem & leaf plot, scatter plot) to communicate mathematical information
5. Approximate the line of regression on a scatter plot and explain the trend
6. Show awareness of quality graphs and possible abuses of statistical graphs

#### Statistical measures

1. Describe and compute measures of centrality (mean, median, mode, midrange) and measures of dispersion (range, variance, standard deviation)

#### Normal curve

1. Use the graph of the normal distribution to make inferences about a population
2. Compute z-scores and percentiles for a given data set
3. Compare two data sets using z-scores

**In the context of the above expectations, a student will:**

#### Mathematical processes

1. Make conjectures and use deductive methods to evaluate the validity of conjectures
2. Recognize that a mathematical problem can be solved in a variety of ways, evaluate the appropriateness of various strategies, and select an appropriate strategy for a given problem
3. Evaluate the reasonableness of a solution to a given problem
4. Use physical and numerical models to represent a given problem or mathematical procedure
5. Recognize that assumptions are made when solving problems and identify and evaluate those assumptions
6. Explore problems using verbal, graphical, numerical, physical, and algebraic representations

#### Mathematical Perspectives

1. Appreciate the contributions that different cultures have made to the field of mathematics and the impact mathematics has on society and culture
2. Understand and apply how mathematics progresses from concrete to representation to abstract generalizations

**Communication**

1. Communicate mathematical ideas and concepts in age-appropriate oral, written and visual forms for a class presentation
2. Use mathematical processes to reason mathematically, solve mathematical problems, make mathematical connections within and outside of mathematics, and communicate mathematically
3. Reflect on personal learning, change of attitude and beliefs, and growth in understanding through mathematical journaling
4. Translate mathematical statements among developmentally appropriate language, standard English, mathematical language, and symbolic mathematics

**Technology**

1. Use appropriate technology such as calculators, computer software, and the Internet to explore, research, solve, and compare mathematical situations and problems

**Professional Development**

1. Be familiar with the National Council of Teachers of Mathematics and the Principles and Standards for School Mathematics, the NCTM website, and NCTM journals

**Instructional Methods and Activities:**

Class lectures will include the following: presentation of material and concepts, activities, problem solving techniques, and class discussions. Quizzes will be given very often throughout the semester. There is no make up for daily quizzes. There is no make up for the tests unless the student presents a legitimate excuse.

**Evaluation and grade Assignment:**

Quizzes	100 Points
First test	100 Points
Midterm Exam	100 Points
Final Exam (accumulative)	100 Points

**Final grade will be determined by point accumulation as follows**

<b>A</b>	<b>90%</b>	<b>-</b>	<b>100%</b>
<b>B</b>	<b>80%</b>	<b>-</b>	<b>89.99%</b>
<b>C</b>	<b>70%</b>	<b>-</b>	<b>79.99%</b>
<b>D</b>	<b>60%</b>	<b>-</b>	<b>69.99%</b>
<b>F</b>	<b>0%</b>	<b>-</b>	<b>59.99%</b>

**Class Rules:** You are not allowed to be late for the class more than 5 minutes; you may not leave the class early. You are to turn off your cellular phone during the class. You are not to send text. You are not to bring food or drink to the class.

**Attendance: Attendance is mandatory.** There are only a total of 4 unexcused or excused absences allowed per semester. If you exceed 4 absences you will **fail** the course. Attendance will be checked each class period and it is your responsibility to sign the attendance sheet.

**Conferences;** Conferences can be beneficial and are encouraged. All conferences should occur during the instructor's office hours, whenever possible. If these hours conflict with a student's schedule, then appointments should be made. The instructor is very concerned about the student's achievement and well-being and encourages anyone having difficulties with the course to come by the office for extra help.

Note: If you have a documented disability, which will make it difficult for you to carry out the course work as I have outlined and / or if you need special accommodation or assistance due to disability, please contact me as soon as possible.

**Course Content**

<b>week</b>	<b>Topic/s-Chapter-Section</b>	<b>Concept/s</b>
1-2	Probability 9-1	Simple, Conditional, Joint, Problem Solving
3-4	Probability 9-2	Single and Multistage, Problem Solving
5-6	Probability 9-3	Tree Diagrams, Odds, Problem Solving
7-8	Probability 9-4	Expected Value, Problem Solving
9-10	Permutations 9-5	Calculating, Problem Solving
11	Statistical graphs 10-1	Collecting Data, Discrete & Continuous Data Graphs
12	Statistical graphs 10-2	Constructing & Reading Graphs
13	Statistical graphs 10-3	Stem & Leaf plots, Scatter-Plots, Problem Solving
14	Measures 10-4	Centrality & Dispersion, Problem Solving
15-16	Normal curve 10-5	Normal Curve, Z-Scores & Percentiles, Problem Solving