University of West Georgia

Course Syllabus
Probability & Statistics for P-8 Teachers (MATH 4713)
Fall 2009

Instructor: M. Yazdani, Ph.D.
Phone: 678-839-4132
Office: 322 Boyd Building
E-mail: myazdani@westga.edu
Website: mathematics-science.org

Conference Hours:
Tuesday 9:00 –11:00, 12:30-3:30
Thursday 9:00 –11:00, 12:30-3:30
Any Other Time By Appointment

Class Time and Location: 3:30 – 4:45:00 TR, Boyd 307

Text:


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, scatterplot) to communicate mathematical information
5. Approximate the line of regression on a scatterplot 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 periodically 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. Calculators are not allowed to be used for quizzes or tests.

Evaluation and grade Assignment:

<table>
<thead>
<tr>
<th>Quiz</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>25%</td>
</tr>
<tr>
<td>Test 2</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35%</td>
</tr>
</tbody>
</table>

Final grade will be determined by point accumulation as follows:
A  90% - 100%
B  80% - 89.99%
C  70% - 79.99%
D  60% - 69.99%
F  0% - 59.99%

Class Policies:

Class Rules: You are not allowed to be late for the class more than 5 minutes; you may not leave the class early.

Attendance: Attendance is mandatory.
There are only 5 unexcused or excused absences allowed per semester. If you exceed 5 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 Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Probability</td>
<td>Simple, Conditional, Joint, Problem Solving</td>
</tr>
<tr>
<td>3-4</td>
<td>Probability</td>
<td>Tree Diagrams, Odds, Problem Solving</td>
</tr>
<tr>
<td>5-6</td>
<td>Permutations</td>
<td>Calculating, Problem Solving</td>
</tr>
<tr>
<td>7-8</td>
<td>Statistical graphs</td>
<td>Discrete &amp; Continuous Data Graphs</td>
</tr>
<tr>
<td>9-10</td>
<td>Statistical graphs</td>
<td>Constructing &amp; Reading Graphs</td>
</tr>
<tr>
<td>11-12</td>
<td>Statistical graphs</td>
<td>Stem &amp; Leaf plots, Scatter-Plots, Problem Solving</td>
</tr>
<tr>
<td>13-14</td>
<td>Measures</td>
<td>Centrality &amp; Dispersion, Problem Solving</td>
</tr>
<tr>
<td>15-16</td>
<td>Normal curve</td>
<td>Normal Curve, Z-Scores &amp; Percentiles, Problem Solving</td>
</tr>
</tbody>
</table>