MATH 4713

Probability and Statistics for P-8 Teachers

Instructor: Kyunghee Moon, Ph. D.

Office: Boyd Building, Room 216

Contacts: Email: kmoon@westga.edu

Phone: 678-839-4151

Office hours: 10:00-12:00 and 2:00-3:20 (T, Th)-Carrollton Campus

11:30-1:00 (F)-Newnan Campus

Textbook:

Billstein, R., Libeskind, S., & Lott, J. (2012). *A Problem solving approach to mathematics for elementary school teachers*, 11th Edition. Pearson Addison-Wesley: Boston, MA.

Overview of the Course: This course is designed to help prospective P-8 teachers develop mathematical understanding of elementary mathematics through collaboration and problem solving. From this course, you will have opportunities to construct concepts in probability and statistics through problem solving and to use those concepts to solve realistic mathematics problems. Although there will be some lecturing at times, most of the instructional time will be used to reconstruct mathematical ideas by communicating and sharing your mathematical ideas with your classmates. Most of the activities in this course are from the textbook listed above, especially from Chapters 9 &10.

Goals and Objectives of the course include, but not limited to,

- Define (theoretical) probability and the law of large numbers and apply them in problem solving.
- State the properties of probability and apply them in problem solving.
- Explain the properties of probability using various representations (such as tree diagram and area model).
- Explain how the results from simulations are related to theoretical probabilities.

- Compute and differentiate between permutations and combinations and use them in problem solving.
- Differentiate among categorical, ordinal, and numerical data and organize real-life data using appropriate representational methods.
- Find and differentiate among the central tendencies (mean, median, and mode) and variations (mean absolute deviation, variance, and standard deviation).
- Explain the properties of normal curve and use them to interpret data.

Attendance and Classroom Rules:

- Students must be **punctual** and **always** attend class. There could be unforeseen emergencies that do come up. However, anyone missing classes **FOUR times or more** during the semester **might not** receive a credit for the course. Medical excuses are only accepted when provided with documentation.
- Students cannot enter the classroom once the class starts and should wait **SILENTLY** outside of the classroom until the door is reopen. In such cases, students will be recorded as tardy. The first two tardiness combined will be considered as one absence. After two tardiness, each tardiness will be considered as an absence.
- Students who disrupt the class for any reason will be escorted to outside of the classroom, disallowed to return for the day, and marked absent.
- Students who have 0 or 1 absence (with **NO** exception for medical issues) will be given an extra credit of 5 points toward the final grade.

Use of Electronics: Calculator is the only electronic device students can use in the classroom. **Calculator as a phone accessory is NOT allowed.** In fact, in no circumstance are students allowed to use any types of electronics other than calculators. Students who do not abide by this rule will be escorted to outside of the classroom, disallowed to return for the day, and marked absent.

Grading: Your final grade in the course will be based on your performance on quizzes, a mid-term exam, a final exam, and the extra credit of 5 points.

Quiz	30 pts
Midterm	30 pts
Final Exam	40 pts
(Extra Credit)	5 pts
	105 pts

- A quiz will be given on Fridays, in particular in the Weeks 3, 4, 5, 6, 9, 10, 11, 12, & 13. Students will be allowed to drop one lowest score (**No makeup quiz in any case**).
- The midterm exam will be in Week 7. The final exam will be in the week of the final exam week. (Check the date and time on the UWG academic calendar.) No make-up exam is permitted except for medical emergencies that can be documented.
- Students are expected to do homework in a timely manner. However, homework will be neither collected nor graded.
- Final Course Grade:

A	90-105
B	80-89.99
C	70-79.99
D	60-69.99
F	Below 60

Overall Philosophy: You are required to provide detailed explanations of the mathematics on all group investigations, quizzes, and exams. This course emphasizes the conceptual framework of mathematics and is designed to avoid the "turn the crank" style of computation that is typical of many mathematics courses. Just getting an answer is not enough. You are expected to explain your ideas. If you are stuck, work with classmates, bring questions to class meetings, or come and see me during my office hours. It is crucial that you explain what you are thinking. It is possible to receive a poor score for a correct answer if you do not explain your ideas. On the other hand, a clear exposition with a minor computational error can receive a good score.

Tentative Schedule

Week	Topics	Materials
2& 3	Introduction Law of Large Numbers Properties of Probability Multistage Experiments & Geometric Probability	Textbook 9.1 Textbook 9.2
4, 5, & 6	Odds & Expected value Permutation & Combination	Textbook 9.4 Textbook 9.5
7 & 8	Midterm Data Types Displaying Categorical Data	Textbook 10.1 Textbook 10.2
9 & 10	Displaying Numerical Data Trendline Correlation	Textbook 10.3 Textbook 10.4
11 & 12	Central Tendency & Variation Percentile & Normal Curve	Textbook 10.3
13 & 14	Presentation Review	
15	Final Exam	