Probability

Class Time: MWTh 3-3:50 P.M.   *Class Room*: Leo 238

Instructor: Angel R. Pineda, Ph.D.   *Office*: RLC 200A
Email: angel.pineda@manhattan.edu   *Phone*: 718-862-7730

Office Hours: Monday 4-5 P.M., Wednesday 1-2 P.M., Thursday 12-1 P.M., or by appointment.

Textbook: Peter Olofsson and Mikael Andersson*, Probability, Statistics, and Stochastic Processes*, John Wiley & Sons, Second Edition 2012.

Course Description:
We will start with the basic theory of probability including the axioms of probability, combinatorics, conditional probability and Bayes' theorem. We will then introduce random variables (discrete and continuous) and describe them through their distributions, expected value and variance. We will also discuss functions of random variables and random vectors. Finally, we will cover limit theorems, including the central limit theorem. The course will balance an intuitive description of the material with applications and proofs.

Prerequisite: MATH 186 Calculus II

Attendance: Attendance is mandatory. Four or more unexcused absences must be reported to the dean of your school. If you are late, please notify the instructor at the end of the class.

Course Objectives:
After completing this course, the students should be able to:
*   Creatively solve problems involving probability theory
*   Compute probabilities using the addition rule, the multiplication rule, conditional probabilities, and counting techniques.
*   Understand both discrete and continuous random variables and use them in solving application problems
*   Understand and use joint distributions
*   Understand the Law of Large Numbers and the Central Limit Theorem.

Course Topics (the course will cover most of chapters 1-4 in the text):
*   Basic Probability Theory (sample spaces, combinatorics, conditional probability, total probability and Bayes' formula)
*   Random Variables (moments, discrete distributions including the uniform, binomial, geometric, Poisson and hypergeometric, continuous distributions including the exponential, normal and lognormal)
*   Joint Distributions (discrete and continuous random vectors, functions of random vectors, conditional expectation, covariance and correlation, moment generating functions)
*   Limit Theorems

Course Homepage (Moodle):
Here you will find four features that will be used in this course:
*   *Email:* make sure that your email on Moodle is one that you check regularly. Homework assignments, announcements and other class related information will be sent via email.
*   *Course Information and Documents:* material covered each week, assignments and solution keys.
*   *Student Discussion Board:* this online forum allows for students and faculty to communicate about the course.
*   *Grades:* students will be able to keep track of their grades online.

Grading:
Homework and Quizzes (20%)

Midterm Exams: (20 % each)

Exam I	Exam II
Thursday October 1	Thursday November 5

Course Project (15 %), Thursday December 3
In the course project, the student will write a paper on a topic of their choice with the instructor's approval. The projects may be theoretical (reading a research paper or writing a proof), computational (running computer simulations) or pedagogical (developing a lesson plan). Details for the course project will be given after Exam I.

Comprehensive Final Exam (25 %), Tuesday Dec. 15, 11:00 A.M.-1:00 P.M.

Tentative Grading Scale

Percent	93-100	90-92	87-89	83-86	80-82	77-79	70-76	67-69	60-66	0-59
Grade	A	A-	B+	B	B-	C+	C	D+	D	F

The exact grading scale will be determined after the final exam. The numerical scores in the tentative grading scale guarantee the associated letter grade but the instructor may change the scale to the student's benefit.

Dates to Remember
       September 4: Late Registration & Add/Drop Ends
       September 7: Labor Day Holiday (No Classes)
       October 12: Columbus Day Holiday (No Classes)
       October 13: Monday Schedule
       October 19: Midterm Grades Due
       November 20: Last Day to Withdraw from Courses
       November 25 – 27: Thanksgiving Holiday (No Classes)
       December 11: Last Day of Classes

Class Policies
- Late homework will not be accepted after the solutions are distributed. In case the homework is handed in before the solutions are posted it will be marked 20% off for every day (or part thereof) it is late.
- Failure to attend class on a day of a quiz will result in a zero grade for that quiz.
- The lowest HW or quiz grade will be dropped.
- No make-up exams will be given, unless you have a medical or family emergency. These emergencies require valid documentation. The grade for a missed exam is zero.
- All exams will be closed book and closed notes, but you will be allowed to bring one sheet of 8" x 11" paper written on one side.
- Cell phones (or other technology not related to the class) in the classroom is only allowed with express permission of the instructor for special circumstances. In general cell phone or other potentially disruptive technology use is not allowed in class.

Suggestions
- The course requires a time commitment of about 9 hours outside of class time. The material builds on itself, so it is very important not to fall behind.
- I suggest you work in groups on your homework but hand in individual solutions, not copied from each other. Doing the homework is when most of the learning occurs.
- I encourage you to come to office hours regularly. I will do my best to help you.

Academic Integrity:
Recall that as students of Manhattan College, you have each signed The Manhattan College Honor Pledge as a part of the Honor Code:

As a Manhattan College student, I will not lie, cheat, or steal in my academic endeavors, nor will I accept the actions of those who do. I will conduct myself responsibly and honorably in all my activities as a Manhattan College student. I am accountable to the Manhattan College community and dedicate myself to a life of honor.

Whenever you put your name on work to be handed in for grading in this class, you are reaffirming the above pledge. Violations of the Honor Code include, but are not limited to, cheating, plagiarism, fabrication, and other forms of academic misconduct. Please see the Manhattan College Community Standards, pp 45-47, for specific examples of the above.

Special Accommodations:
- Students with special needs should bring appropriate documentation to the Specialized Resource Center, Miguel 300, http://manhattan.edu/academics/specialized-resource-center, to obtain an Academic Adjustment/Auxiliary Aid form. Bring the completed form to me as soon as possible, and together we will decide on how best to fulfill the adjustments and/or aids listed on the form.
- Student athletes should bring their event schedules to me as soon as possible.

The material in this syllabus may be changed at the instructor's discretion. Any changes will be communicated to the students.