UMass Boston
Department of Mathematics

Semester: Fall 2013

Course Name: Math 345/545 - Probability and Statistics I

Section Number: Section 02 (combined section)

Description: Introduction to the fundamental ideas and techniques of probability theory. Topics covered: properties of probability, independence, conditional probability, discrete and continuous random variables, density and distribution functions, expectation, variance, covariance, moments, correlation, joint distribution, marginals, some common distributions such as uniform, Bernoulli, binomial, exponential, Poisson and normal distribution, and the Central Limit Theorem. The course also introduces some basic ideas of statistical analysis e.g. parameter estimation and hypothesis testing.

Pre-requisites: MATH 141 or an equivalent course on differential and integral calculus of single variable functions (including exponential and logarithmic).

Schedule: TuTh 5:30pm - 6:45pm in W-01-047.
For every hour in class, you should dedicate at least three additional hours studying for this course. Students should not make any travel plans that would require them to leave before December 22, 2013.

Textbook: TBD.

Instructor: Catalin Zara, Associate Professor of Mathematics.
            Email: catalin.zara@umb.edu
            Office: Science 3-091
            Website: http://www.math.umb.edu/∼czara

Office hours: By appointment, TuTh 3:30pm - 5:20pm in S-03-091. Please use the online form available on the course website (linked from the page above) to schedule a 10 or 20 minute appointment, at least 3 hours in advance. You can stop by without a confirmed appointment, but I may not be in my office or available.

Exams: There will be two in-class exams during the semester (currently scheduled for October 10 and November 5), plus a cumulative final during the final exam period. Make-up exams will be allowed only with an official excuse. In all other situations, a missed exam will get a score of zero.

Quizzes: Each Tuesday there will be a 10-minute quiz on the topics covered the previous week.

Homework: Will be assigned every week and due before the class on Tuesday. Late homework will not be accepted without an official excuse or prior permission from the instructor. Similitude beyond reasonable doubt will not be tolerated. Homework will be posted a week before it is due and graded homework can be picked up in class.

Attendance: Regular class attendance is required and active class participation is expected. Students are responsible for material and announcements missed due to an absence. Please come to class on time and turn off your cell phone before the class begins. If you are repeatedly late or otherwise perturb the learning environment, you will be penalized.

Grading:

Exam 1: 100 points	A : 90%
Exam 2: 100 points	B : 80%
Final exam: 200 points	C : 70%
Quizzes: 100 points	D : 60%
Homework: 100 points	

Student conduct: Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the University Catalog and Student Handbook. The Code is available online:

http://www.umb.edu/life_on_campus/policies/code/

Special accommodations: Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, Campus Center, UL Room 211, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of Drop/Add period.

Changes: Any changes or class cancellations will be announced in class or by e-mail or will be posted online.

Tentative course schedule:

Dates	Topics	Comments
Sep 3, 5	Sample spaces, events, counting problems	
Sep 10, 12	Permutations, combinations, binomial coefficients	Add/drop: 09/10
Sep 17, 19	Axioms of probability, combinatorial probability, independence	
Sep 24, 26	Conditional probability, Bayes formula	
Oct 1, 3	Random variables, types of random variables: discrete and continuous, density and distribution functions	
Oct 8, 10	Exam # 1. Joint distribution, marginals, independence of random variables, conditional distribution.	Exam 1: 10/10
Oct 15, 17	Expected value, variance, standard deviation	
Oct 22, 24	Moments, moment generating function.	
Oct 29, 31	Covariance, correlation, conditional expectation.	
Nov 5, 7	Exam # 2. Special discrete random distributions: Bernoulli, binomial, Poisson.	Exam 2: 11/05 PWF: 11/07
Nov 12, 14	Special continuous random distributions: normal, exponential, gamma.	
Nov 19, 21	Central Limit Theorem .	
Nov 26	parameter estimation, hypothesis testing.	Thanksgiving: 11/28
Dec 3, 5	t-test, chi-square test.	
Dec 10, 12	Review.	
Dec xx	Final Exam	