

COURSE SYLLABUS

Probability and Statistics I (Introduction to Probability) – STAT/MATH404-001

Fall Semester, 2012: Tuesdays and Thursdays 4.30 – 5.45pm in MUND 307

Prerequisites: Differential and integral calculus is essential; some background in statistics is helpful

Text: Wackerly, D.D., Mendenhall III, W. & Scheaffer, R.L., *Mathematical Statistics with Applications* (2008), 7th Edition, ISBN-13: 978-0-495-11081-1, ISBN-10: 0-495-11081-7

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Course Web Page: <http://webpages.math.luc.edu/~tobrien/courses/stat404/course-homepage.html>

Course Overview

This is the first semester of a two-semester sequence in mathematical statistics. This first semester is an exploration of probability as a mathematical model of chance phenomena (the second semester explores the statistical analyses and mathematical justification based on these probability models). In the first semester class, topics covered include discrete and continuous random variables, transformations, multivariate distributions, correlation, independence, variance-covariance, special distributions (binomial, Poisson, gamma, chi-square, beta, normal, multivariable normal, t and F), expectations of functions, convergence in probability, convergence in distribution, moment generating functions, and the Central Limit Theorem. Grading will be based on quizzes, exams and homework assignments; homework will be assigned on a regular basis, and collected and graded in a timely manner to provide needed feedback.

This course requires a good knowledge of calculus, including sums of infinite series, differentiation, and single and double integration. Students needing a review of these concepts should co-enroll in the two-credit review class: STAT 388-001.

Homework, Quizzes and Exams

Homework assignments will be given typically each class, due at the beginning of the next class period, and graded and returned to students in a timely manner to give students needed feedback. Late homework will be penalized heavily, and is never accepted after the assignment has been graded. The lowest homework score before the midterm exam and the lowest homework score of the remainder will be dropped. It is very important that students show all your work on homework and tests; give explanations as unsupported numerical answers do not suffice. Students will need their own calculator during quizzes/exams. Calculators may not be shared, and no personal computers, cell phones, etc. are permitted during quizzes and exams.

Grading Scheme

Homework	25%
Quiz 1 – Tuesday, September 25 th	12.5%
Midterm Exam – Thursday, October 25 th	25%
Quiz 2 – Tuesday, November 20 th	12.5%
Final Exam – Tuesday, December 11 th	25%

Final course (letter) grades will be awarded according to the following grading scheme:

[87.5 , 90.0) = B+	[92.5 , 100] = A	[90.0 , 92.5) = A-
[77.5 , 80.0) = C+	[82.5 , 87.5) = B	[80.0 , 82.5) = B-
[67.5 , 70.0) = D+	[72.5 , 77.5) = C	[70.0 , 72.5) = C-
	[60.0 , 67.5) = D	[0.0 , 60.0) = F

Make-up Exams

The Quiz 1 score will be raised to the grade of the Midterm Exam if the latter is higher, and the Quiz 2 score will be raised to the grade of the Final Exam if the latter is higher. In this sense, quiz scores are unofficial, and hence there will be no make-up quizzes. A make up for the Midterm Exam will be given only in case of an illness verified by a note from a physician or a death in your family. If you miss the Midterm Exam for any other reason, it will be given the grade of Final Exam. The Final Exam is very final; if you miss that, a make-up is given only with approval of your dean (and it is granted only for documented serious reasons).

Academic Honesty

It is presumed that you will do your own work on the homework and tests. Discussing homework problems with others is encouraged but it is extremely important to understand the difference between working with another person and copying that person's work. **If you discuss homework with others, you must cite their names on your homework paper (at the top of the first page).** Submitting work as your own which is copied or paraphrased from someone else is not permitted. Cheating includes, but is not limited to, illegal collaboration, copying, using materials not permitted on tests, and aiding others on tests. Anyone found cheating will not be permitted to withdraw and will receive a grade of F for the course. Your academic dean will be informed and a statement will be placed in your permanent file.

Tentative Semester Schedule (Text Sections) – this schedule is subject to change (check website)

Tuesday	Thursday
08/28 – Chap. 1, §2.1 - §2.4: Intro & basic prob.	08/30 – §2.5: Calculating basic discrete probs.
09/04 – §2.6: Counting tools	09/06 – §2.7 & 2.8: Conditional probs. and laws
09/11 – §2.9 & 2.10: Counting, Bayes rule	09/13 – Finish Chap. 2; Random variables
09/18 – §3.1 & 3.2: Discrete prob. distributions	09/20 – §3.3: Expected values (discrete)
09/25 – Quiz 1	09/27 – §3.4 & 3.5: Binomial & Geometric
10/02 – §3.5 & 3.6: Geometric & Neg. Binomial	10/04 – §3.7: Hypergeometric
10/09 – Fall Break	10/11 – §3.8 & 3.9: Poisson and MGFs
10/16 – §3.10 – 3.12: PGFs, Chebyshev's	10/18 – §4.1 & 4.2: PDFs
10/23 – §4.3: Expected values (continuous)	10/25 – Midterm Exam
10/30 – §4.4 & 4.5: Uniform and Normal distns.	11/01 – §4.5 & 4.6: Normal and Gamma distns.
11/06 – §4.6: Gamma distribution	11/08 – §4.7: Beta distribution
11/13 – §4.8 – end: Other EVs, Chebyshev's	11/15 – §5.1 & 5.2: Bivariate and multivariate
11/20 – Quiz 2	11/22 – Thanksgiving Break
11/27 – §5.3 & 5.4: Marginal, conditional, indep.	11/29 – §5.5 & 5.6: EV and special theorems
12/04 – §5.7 & 5.8: Covariance, linear functions	12/06 – §5.9 - end: Multinomial, N_2 , cond'l EV.

Note #1: All quizzes & exams will be closed book; students will be permitted to bring in an index card.

Note #2: The last day that a student may withdraw without a penalty grade of "WF" is Friday, November 2nd