MATH 241 Fall 2014 Course Syllabus

Adam Kapelner, Ph.D.

Queens College, City University of New York

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Instructor	Professor Adam Kapelner
Office	325 Kissena Hall I (64-19 Kissena Blvd)
Contact	`kapelner@qc.cuny.edu`
Section A Time / Loc	Tuesday and Thursday 9:15 - 10:30AM, Kiely 326
Section B Time / Loc	Tuesday and Thursday 12:15 - 1:30PM, Kiely 326
Office Hours	TBA
Course Homepage	github.com/kapelner/QC_Math_241_Fall_2014_15 (course homepage)

Course Overview

MATH 241 is an introduction to the basic concepts and techniques of probability and statistics with an emphasis on applications. Topics to be covered are below (not in order of coverage):

- Basic Set Theory
- Counting Methods — permutations and combinations
- Basic Probability Theory — axioms, conditional probability, in/dependence
- Modeling with Discrete Random Variables, expectation, variance, covariance
- Modeling with Continuous Random Variables, expectation, variance, covariance
- Multidimensional Random Variables
- Law of Large Numbers, The Central Limit Theory, and the Normal Distribution
- Confidence Intervals, Hypothesis Testing, p-values
- Summary Statistics
- Data Displays (boxplots, histograms, etc)

Students taking this course may not receive credit for MATH 114, except by permission of the chair. Pre/corequisites include MATH 132 or 143 or 152.

This is not your typical mathematics course. This course develops ideas for helping to make decisions based on data. The course does not dwell on the details of computation but will make use of computation especially using the R statistical language.

Course Materials

Textbook: Probability and Statistical Inference 9th ed. by Hogg, Tanis and Zimmerman. There will be additional readings as well, but this will be the main, required text. Although it is required, most of the material in the class comes from the lecture notes. The textbook is a way to get "another take" on the material.

Computer Software: We will also be using R which is a free, open source statistical programming language and console. You can download it from: `http://cran.mirrors.hoobly.com/`. I do not expect you to do *any* programming. I will be giving you R code to run and expect you to interpret the results based on concepts explained during the course.

Calculator: TBA I highly recommend buying a TI-89; I have been using it ever since high school (that's over 10 years) and the dividends it pays just keep getting bigger. It can be used to check your answers on a lot of the statistical tests we will be doing in this course and it can solve calculus as a bonus. You can buy them used online for less than $100.

Lectures

I have a no computer / tablet / phone policy during lectures. Only pen / pencil and paper.

Important Dates Schedule

Class runs from Tuesday, August 28 until Thursday, December 11 without class on:

- Tuesday, September 23[1]
- Thursday, September 25 (Jewish Holiday)
- Thursday, October 9 (Jewish Holiday)[2]
- Thursday, October 16 (Jewish Holiday)[2]
- Thursday, November 27 (Thanksgiving)

Homework

There will be 13-15 homework assignments. Homeworks will be assigned and placed on the course homepage and will usually be due a week later in class. Homework will be graded out of 100. Homework must be neat and stapled.

Late homework will be penalized 10 points per day for a maximum of three days. Do not ask for extensions; just hand in the homework late. Late homework can be put in my mail slot in the Department of Mathematics main office in Kiely Hall.

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[1]The university calendar states that "Classes follow a Friday schedule." I would like to have classes as normal this day to make up for October 9 and 16.

[2]The university operates as normal, but I cannot be here. Thus, these two classes will have to be made up.

Graded homework will be returned in class. Regrades are handled during office hours or right after class is over. Scores for homeworks are finalized one week after the graded copies are handed back. Thereafter there will be no changes and no re-grading. Do not delay checking your graded homeworks.

Homework is the *most* important part of this course. Success in Statistics and Mathematics courses comes from experience in working with and thinking about the concepts. It's kind of like weightlifting; you have to lift weights to build muscles.

You are encouraged to seek help from the instructor if you have questions. **You may also work with and help each other.** You must, however, submit your own solutions, with your own write-up and in your own words. There can be no collaboration on the actual *writing*. Failure to comply will result in severe penalties. The university honor code is something we take seriously and we send people to the Dean every semester for violations.

Homework Bonus

Part of good mathematics is its beautiful presentation. Thus, **there will be a 15 point bonus** added to your homework grade for typing up your homework using the LaTeX type-setting system. You can download LaTeX for Windows here, for MAC here. For editing and producing PDF's, I recommend TeXworks which can be downloaded here. Please use the LaTeX code provided on the course homepage for each homework assignment. Since this is extra credit, do not ask me for help in setting up your computer with LaTeXin class or in office hours.

Examinations

- Midterm examination I will be held TBA

- Midterm examination II will be held TBA

- The final examination will be held TBA

During examinations strict rules will be in effect with regard to honor code.

Grading and Grading Policy

Your course grade will be calculated based on the percentages as follows:

Homework	15%
Class participation	5%
Midterm Examination I	20%
Midterm Examination II	20%
Final Examination	40%