Probability and Mathematical Statistics I

Department of Statistics 36-325/725 Fall 2001

LECTURES: MWF 9:30-11:20 DH A317
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WEB-SITE: $\text{www.stat.cmu.edu/}\tilde{}\text{larry/} = \text{stat325.01}$
TEXT:
(1) On-line lecture notes available at: $\text{www.stat.cmu.edu/}\tilde{}\text{larry/} = \text{stat325.01}$
(2)*Probability and Statistics.* Second Edition. by Morris H. DeGroot.

INTRODUCTION

This is an intense, fast-paced course on probability and statistics. It is intended for undergraduates in Statistics, Mathematics and Computer Science and also for graduate students in Computer Science. I assume you have a strong background in calculus and a knowledge of basic linear algebra (vectors and matrices). The course is excellent preparation for studying statistics, machine learning, data mining and artificial intelligence. I do not assume any knowledge of probability or statistics but be forewarned that the course does move rapidly.

36-325 or 36-725?

If you are an undergraduate student, you should register in 36-325. If you are a graduate student, you should register in 36-725. The homeworks and tests will be the same for all students. When I assign grades, I will do so separately for the two groups. Graduate students may be required to do some extra work.

WEBSITE and LECTURE NOTES

Please check the website on a regular basis:
$\text{www.stat.cmu.edu/}\tilde{}\text{larry/} = \text{stat325.01}$
The website has the homeworks, handouts, and lecture notes. Please download the lecture notes and read the notes **before** class. Most files on the website are in postscript. The website shows you where to get a free postscript previewer if you don't have one already.

ASSESSMENT

Problems will be assigned each week. You may have to read ahead to do some of the problems. You should download the assignments from the web. Homework is to be handed in at the beginning of class, usually on Fridays. I will hand out solutions each week. I encourage you to discuss homework problems with other students but do **not** copy other students' assignments. In other words, work together if you wish, but write up your solutions on your own.

There will be 2 in-class tests and a final examination. **The test dates are: Friday, September 28 and Monday October 29. Please write these dates down now.** If you miss a test, bring a valid medical excuse **within one week.** There are no makeup tests. Notes written on one side of one sheet of paper will be permitted for the tests and the exam. Calculators are also allowed. The final grade will be based on the following breakdown:

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Homework 25%
Test 1   25%
Test 2   25%
Exam     25%
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LATE HOMEWORK

Homework is due at the beginning of class. Late homework will not be accepted.

COMPUTING

The assignments will involve some computing. We wull use R which is available free at
http://www.cran.r-project.org/

You may also use Splus which is available on Andrew by typing: Splus. Splus and R are essentially the same but R is faster and is free. I will teach you all the R you need to know. You may use something other than R if you choose but then you are on your own.

TOPICS

The course follows my lecture notes. The textbook by DeGroot is more of a backup but it is very good. You should follow my notes then find the corresponding section in DeGroot. The main topics are:

- Introduction to Probability
- Random Variables
- Expectation
- Inequalities
- Convergence of Random Variables
- Introduction to Statistical Inference

OFFICE HOURS

I will not keep formal office hours. If you wish to meet with me, call or send email and make an appointment. The grader will keep office hours.