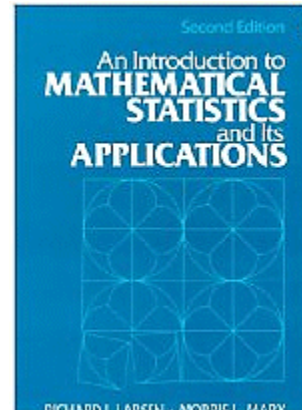


# Mathematics 328, Spring 2009

## Mathematical Statistics and Probability

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### Required Text

*An Introduction to Mathematical Statistics and Its Applications*,  
2<sup>nd</sup> Edition, Richard Larsen and Morris Marx.

### Required Software

Winstat  
Maple

This is a powerful computer algebra system that is available over the network. A Student Edition of Maple is available for purchase from MapleSoft. See me for details.

### Network Resources

Blackboard	<a href="http://blackboard.agnesscott.edu/">http://blackboard.agnesscott.edu/</a>
Student network drive	W:\students\math\Math 328\
Egrade	<a href="http://egrade.agnesscott.edu/classes/328AS09">http://egrade.agnesscott.edu/classes/328AS09</a>

### Goals

- Learn to solve basic combinatorics and probability problems.
- Develop the ability to describe random events using probability density functions and cumulative distribution functions, and to compute probabilities associated with these events.
- Be able to work with random variables.
- Be able to work with the properties and applications of the basic distribution functions.
- Develop the mathematical foundation for statistical estimation, hypothesis testing, and regression
- Learn to communicate mathematics effectively, both orally and in writing.

### Topics

- Introduction: Chapter 1 (not covered in class but should be read independently)
- Probability: Chapter 2, sections 1–11
- Random Variables: Chapter 3, sections 1–10, 12
- Special Distributions: Chapter 4, sections 1–6
- Estimation: Chapter 5, sections 1–5, 8–10
- Hypothesis Testing: Chapter 6, sections 1–3
- The Normal Distribution: Chapter 7, sections 1–4, selected topics in 5 and 6
- Regression: Chapter 10, sections 1–5

### Office Hours

I do not have regularly scheduled office hours. Rather, you are encouraged to stop by my office at any time when you have questions or problems and if I am not too busy I will be happy to work with you. You may also stop by to make an appointment for a time that is

mutually convenient. Another good way to contact me is through email, particularly during the evenings or weekends. I promise to respond to your email as quickly as I can.

### Computing Resources

We will make important use of computer technology to help us learn about probability and statistics, and to simulate and analyze chance experiments. We will use Maple and Winstat to help with computations encountered in studying probability and statistics.

### Assignments and Exams

The first and most important assignment is to **regularly read the text** and to work through and understand the examples in each section. You should try to spend time, no matter how short, on this every day. Do not just accept mathematical statements or examples discussed in the text, but try to verify these statements and examples yourself. Working with paper and pencil or with Maple while you read the text is a good way to do this. If you have questions, ask in class or stop by my office. Since the reading is so important, some hints on how to do it might be helpful. You may find that slight variations on the following scheme will work for you.

- a. Plan on doing the reading more than once, and do not make it an essential goal to understand everything in the reading the first time through it. The first reading should be devoted only to getting a general overview of the material of the section.
- b. After the first reading, stop for a few minutes and attempt to summarize to yourself, in your own words, what the section is all about. Then immediately reread the section.
- c. During the second reading, make a serious effort to understand *all* of the material in the section. This does *not* mean to memorize it, but rather to understand all of the points before going on.
- d. If you do not understand something during the second reading, put the book aside awhile and return to it later when your mind is fresher. If you still do not understand it after returning to it, ask me or some other members of the class about it. Do make sure you eventually understand all of the material. You will probably get tripped up in later reading, in doing the homework, or on tests if you treat material you don't quite understand as "probably not all that important."
- e. Do not get discouraged if some points require some time to understand. It is not uncommon to have to think about a point in a math text for a day or even several days before it becomes clear what is really going on.

You will be given homework practice problems to do from each section we cover. You will need to take the responsibility to keep up with these problems and work on the appropriate problems as we cover those sections in class. You are encouraged to work with others on these problems and check each other's work. You may ask questions about them in class or come talk to me about the problems. You are expected to check your answers to the odd-numbered problems in the back of the book. Answers to selected even-numbered problems will be checked using the Egrade web site. You may rework any of the Egrade problems until you correctly solve them. The purpose of the homework is to help you learn the concepts and techniques for working with probability and statistics and to prepare for the exam problem sets. Therefore you should complete the homework before the exams are given.

In addition you will be given some problem sets that I will ask you to submit for me to grade. You are encouraged to work together on all these problems, but each student is always expected to write up (and understand) her own solutions.

The homework assignments and problem sets can be found at the course site on Blackboard. Maple worksheets used in the course will be kept in the math328 folder on the student network drive.

Information about homework, problem sets and other assignments will be posted as announcements on Blackboard so I expect you to check Blackboard on a regular basis.

There will be three take-home problem set exams. The first will cover chapters 2 and the first five sections of chapter 3, the second will cover the rest of chapter 3, chapters 4 and 5. The last problem set exam, in lieu of a final, will cover chapters 6, 7 and 10, with perhaps some additional problems from the earlier chapters. This is subject to change as necessary.

### **Honor Code and Plagiarism**

You are encouraged to work together on the homework for this course, but each student is always expected to write up (and understand) her own solutions. Working with someone else to understand an idea or a concept or even the requirements of an assignment is group learning and is encouraged. But once you understand what you were struggling with, you should complete the assignment individually, giving the work your own identity.

### **Attendance**

Class involvement is important. This includes your attendance and punctuality, your attitude, your willingness to contribute ideas and questions, to listen to your peers, and to be a contributing partner in collaborative efforts. Regular attendance for this class will be very important since much of our class time will be spent on discussing mathematical concepts and working on problems. It is therefore expected that you will attend and be prepared for every class, but it is also recognized that circumstances may occasionally necessitate missing a class. You are responsible for all material discussed in class whether you are there or not, and for submitting all work before the due date. Approval for extensions **must** be obtained in advance. Excessive number of unexcused absences will result in a reduction of your course grade.

### **Grading** (I reserve the right to change the point allocation if necessary)

3 Exams: 100 points each	300 points
Problem sets:	100 points
Total:	400 points