

Mathematical Statistics
STA 4322/5325
Fall 2003

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Professor's Office Hours: Tuesday 2:00 - 3:00, Wednesday 2:00 - 3:00 and by appointment.

Grader: Mr. Zhiguo Li
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Grader's Office Hours: Monday 4:00 - 5:00, Friday 10:00 - 12:00.

Location and time: 108 OSB, Tuesday and Thursday, 12:30 - 1:45.

Text book: *Mathematical Statistics and Data Analysis*, 2th edition, by John A. Rice.

Prerequisites: STA 4442 (Intro to Prob) and MAC 3313 (Calc III).

Course Objective: To introduce the theory and concepts which underly and justify commonly used statistical methods.

Course Outline: We will review the basic probability material of Chapters 1 - 2 and, in more detail, the material covered in Chapters 3 -4. The rest of the course will cover Chapter 6, and parts of Chapters 8 and 9. A tentative list of topics is given below.

1. Review of basic probability (Chapters 1 and 2).
2. Joint distributions; distributions of sums and quotients.
3. Expectations of functions of random variables.
4. Moment generating functions.

5. Distributions derived from the normal distribution: χ^2 , t and F distributions. The distribution of the sample mean and the sample variance.
6. Parameter estimation: method of moments and maximum likelihood.
7. Pearson's chi-squared goodness-of-fit test.
8. Comparison of estimators using mean squared error and bias.
9. Asymptotic distributions via the *delta* method.
10. The Fisher information for parametric families of distributions.
11. Asymptotic distributions for maximum likelihood estimates.
12. The Cramer-Rao lower bound.
13. Sufficient statistics and the factorization theorem.
14. Introduction to Hypothesis Testing.
15. The Neyman-Pearson Lemma.

Exam dates

1. Midterm 1 (September 16 - 23, to be decided later).
2. Midterm 2 (October 28th - November 4th, to be decided later).
3. Final exam: Wednesday, December the 10th, 7:30 am - 9:30 am, in 108 OSB.

Grading Policies: 5 % attendance, 10 % class participation, 25% homeworks, 30 % mid-terms and 30 %final exam.

93 or more	A	90 - less than 93	A-
86 - less than 90	B+	83 - less than 86	B
80 -less than 83	B-	76 - less than 80	C+
73 - less than 76	C	70 -less than 73	C-
66 - less than 70	D+	63 - less than 66	D
60 - less than 63	D-	less than 60	F

There is no curving of grades in this course. Your grade is based entirely on your performance.

Attendance Policies: You will get the 5 % bonus points for attendance if you do not miss more than *four* classes. Please note that that if you miss more, for any reasons, you will get 0 % on attendance.

Homework Policies: Homework assignments and their due dates will be communicated in class and also posted at <http://stat.fsu.edu/flori>. The solutions must be handed to me during class on the due date. *Late assignments will not be accepted for any reasons, medical or otherwise.* One assignment, with the lowest grade, will be dropped. Please write clear and detailed answers to the homework problems. Homework solutions will be handed to you at the time the homework is due. Any questions concerning homework grades should be addressed to the grader during his office hours.

Exam Policies: The exams will be closed book and closed notes, but the use of a pocket calculator will be permitted. *No student is exempt from any exams.* If you have a medical or some other situation that prevents you from appearing at the exam, you have to talk to me **in advance and obtain permission.**

Academic Honor System: “The Academic Honour System of The Florida State University is based on the premise that each student has the responsibility to: 1) Uphold the highest standards of academic integrity in the student’s work, 2) Refuse to tolerate violations of academic integrity in the academic community, and 3) Foster a high sense of integrity and social responsibility on the part of University community.”

Please note that violations of this Academic Honor System will not be tolerated in this class. Specifically, incidents of plagiarism of any type or referring to any unauthorized material during examinations will be rigorously pursued by this instructor. Before submitting any work for this class, please read the “Academic Honor System” in its entirety (as found in the FSU General Bulletin and in the FSU Student Handbook) and ask the instructor to clarify any of its expectations that you do not understand.