

STAT414, Semester I 2004-2005

Mathematical Statistics

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The objective of this course is to introduce to students the basic theory of probability and statistics. It provides a necessary basis for students for a further study of other advanced statistical courses.

Topics to be covered:

1. Introduction to Probability: set theory, sample space.
2. Conditional Probability: conditional probability, independence, Bayes' theorem.
3. Random variables and distributions: random variables, distributions, marginal distribution, conditional distribution, multivariate distribution.
4. Expectation: mean, median, variance, covariance, correlation, conditional expectation.
5. Special distributions: Binomial, Poisson, normal, central limit theorem.
6. Estimation: Prior, Posterior, Bayes estimator, MLE.
- 7*. Testing hypotheses: The t test, the F test.

Prerequisites: MATH 221, 251, or 253.

Recommended texts/references:

1. DeGroot, Morris H. and Schervish, Mark J. (2002) *Probability and Statistics* (third edition). Boston: Addison Wesley. (textbook, required)
2. Hogg, R.V., McKean, J.W., and Craig, A.T. (1995) *Introduction to Mathematical Statistics* (fifth edition), Prentice Hall. (reference, not required)

Grading Rule: Assignments: 10%; First midterm: 30%; Second midterm: 30%; Final examination: 30%.

Lectures: MWF 11:30-12:20 pm classroom: BLOC 150

Tentative Office hours: WF 16:00-17:00

Statements on the Course:

1. Late assignments will not be graded.
2. A makeup examination will be only given to the students who could provide satisfactory evidence that the absences are due to some causes beyond their control.
3. The student's semester grade will be based solely upon on the above grading rule. No exception will be made at the end of the semester for particular students.
4. STATEMENT ON DISABILITIES (from "Beginning of semester information" by Professor M. Longnecker): The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Support Services for Students with Disabilities in Room 126 of the Koldus Student Services Building. The phone number is 845-1637.
5. STATEMENT ON PLAGIARISM (from "Beginning of semester information" by Professor M. Longnecker): The handouts used in this course are copyrighted. By "handouts", I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission. As commonly defined, plagiarism consists of passing off as one's own ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty".