

Fall 1999

Math 472 – Statistical Inference (3)

Sampling and parameter estimation, tests of hypotheses, correlation, regression, analysis of variance, sequential analysis, rank order statistics.

Pre: 471 or consent

**Possible Texts:**

*Probability and Statistics* by M. DeGroot and M. Schervish, Addison-Wesley  
*Mathematical Statistics* by Wackerly, Mendenhall and Scheaffer, Brooks/Cole.

**A. Sampling Distributions (4 lessons)**

Chi-square,  $t$  and  $F$  distributions, distributions of the sample mean and variance.

**B. Point Estimation (5 lessons)**

Properties and methods of point estimation.

**C. Interval Estimation (4 lessons)**

Confidence intervals for means, variances, proportions and differences.

**D. Tests of Hypotheses (19 lessons)**

Neyman–Pearson lemma and likelihood ratio tests; tests concerning means and variances, tests based on count data, nonparametric tests, analysis of variance.

**E. Regression and Correlation (6 lessons)**

Regression, bivariate normal distribution, method of least squares.

**Course Objectives:.** Upon successful completion, the student will have a foundation in the basic topics of the theory of Statistics listed above in the syllabus. Emphasis on rigor will provide students the understanding needed for graduate work, and in the study of the logical foundations of mathematics.

**Program Objectives:.** Math 472 is a senior level course in Statistics, an important subject with many applications in all scientific fields. This course promotes our goal that our students learn, understand, and be able to apply several mathematical topics at the junior and senior level, and that our students acquire the ability and skills to apply mathematics to other fields.