Instructor: Dr. Leilei Zeng

Prerequisite:

STAT 330

Textbook:

Statistical Inference 2nd Edition by Casella and Berger, publisher Duxbury/Thompson Learning, c.2002

Calendar Description:

Distribution theory, methods for constructing tests, estimators, and confidence intervals with special attention to likelihood methods. Properties of the procedures including large sample theory.

Outline:

1. Review of probability and distribution theory. Conditional probability, marginal and conditional distributions, independence. Distributions of functions of random variables. Bivariate and multivariate normal.

2. Likelihood methods of inference. Multiparameter likelihoods, maximum relative likelihood, likelihood ratio statistic. Sufficiency.

3. Testing hypotheses. Neyman-Pearson theory. Most powerful and uniformly most powerful tests. Likelihood ratio tests. Acceptance sampling.

4. Interval estimation. Inversion of significance tests.

5. Bayesian estimates, point estimates, predictive distributions.

6. Stochastic convergence. Limiting distributions. Continuity theorem. Central limit theorem.

7. Theory of likelihood functions, regularity conditions, properties of information matrix, information in summary statistics, sufficient statistics, parameter transformations, efficiency, consistency. Maximum likelihood large sample theory.

Grading Scheme:

Assignments-20%
Midterm-30%
Final Exam-50%