STATISTICS 801-4
MATHEMATICAL STATISTICS

Spring 2002
DAY COURSE

Instructor: R. SITTER

Text:

"Statistical Inference" by G. Casella & R. Berger. Publisher: Wadsworth.

Course Outline:

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

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.
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:
Homework 30%
Mid-Term 30%
Final 40%

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

Revised October 2001