STATISTICS 801-4
MATHEMATICAL STATISTICS

Spring 2004
DAY COURSE

Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 604-291-3112 or csdo@sfu.ca

Instructor: R. Lockhart

Text:

No Textbook

Calendar Description

Advanced mathematical statistics. A survey of basic concepts in point estimation, interval estimation, and hypothesis testing. Principles of inference.

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. Expectation, moments and transforms.
2. Distributions of functions of random variables. Bivariate and multivariate normal.
3. Approximate distribution theory: central limit theorem, delta method, saddlepoint methods, Monte Carlo.
4. Likelihood methods of inference. Multi parameter likelihoods, maximum relative likelihood, likelihood ratio statistic. Maximum likelihood large sample theory.
5. Optimality theory for estimation: bias, mean-squared error, sufficiency, completeness, UMVU estimation.
6. Testing hypotheses. Neyman-Pearson theory. Most powerful and uniformly most powerful tests. Likelihood ratio tests.
7. Interval estimation. Inversion of significance tests.
8. Bayesian estimates, point estimates, predictive distributions. Introduction to decision theory.

Grading:

Assignments: 60%
Final Exam: 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. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Please consult the General Guidelines of the calendar for more details.

Revised October 2003