# STATISTICS 450-3
# STATISTICAL THEORY

**Fall 2001**
**DAY COURSE**

## Instructor: DR. R. SITTER

## Prerequisite:

STAT 350. Students with credit for MATH 472 may not take STAT 450 for further credit.

## Textbook:

*Introduction to the Theory of Statistics* (3rd ed) by Mood, Graybill & Ross; published by McGraw Hill.

## Calendar Description:

Distribution theory, methods for constructing tests, estimators, and confidence intervales 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. Inversiuon 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

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

*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 July 2001