SD 20

Proj

MA499 Directed Study : Statistics (3 credits)
Spring 2000
Tu. & Th. 1:00 -- 2 :20 PM H018

Instructor: Mi-Soo Smith Office H018 Ext. 681
Office Hour : By Appointment

Textbook : Mathematical Statistics with Applications
by Wackerly, Mendenhall , Scheaffer (Fifth Edition) Duxbury Press
References : (1) Applied Nonparametric Statistical Methods
By P. Sprent (Second Edition) Chapman & Hall
(2) Introduction to the practice of Statistics
By Moore and McCabe (Second Edition) W.H. Freeman & Company

Course Description: A continuation of MA331 , establish further mathematical foundation for Statistics, Moment generating functions, multivariate Probability Distributions, functions of random variables, Regression Model, Considerations in Designing experiments, Analysis of variance, Analysis of Categorical Data, Non-parametric Statistics.

Grading Policy : Homework (40%) , Quizzes (30%) , Final Examination (30%)

Course Outline: The following course outline is a tentative one. We may need to adjust it as the course progresses.

Chapter 3 (2 weeks)
3.1 – 3.10 : Quick review of Discrete probability distributions (Binomial Distribution Geometric Distribution, Hyper-geometric Distribution, Poisson Distribution) Moments, Moment -Generating functions, Probability-Generating Functions

Chapter 4 (1 week)
4.1 – 4.8 : Quick review of Continuous Distributions (Uniform Distribution, Normal Distribution, Gamma Distribution, Beta Distribution) Other comments

Chapter 5 (2 weeks)
5.1 – 5.11 : Bivariate and Multivariate Prob. Distributions , Marginal and Conditional Prob. Distributions. Independent Random Variables, The Expected Values , Special Theorems) , Covariance, Expected Value and Variance of Linear Functions of Random Variables. Multi-nomial Prob. Distribution , Bivariate Normal Distribution , Conditional Expectations

Chapter 6 (2 weeks)
6.1 – 6.6 : Finding the probability Distribution of a function of random variables, Method of Distribution functions, Method of Transformation, Method of Moment-Generating function, Order Statistics

Chapter 11. (2 weeks)
11.1 –11.15 : Linear Models, Method of Least Squares, Simple Linear Regression Model, Correlation, Fitting the Linear Model, Multiple Linear regression , Testing Hypothesis

Chapter 12 (1 week)
12.1 – 12.4 : Elements affecting the information in a sample, Designing experiments to increase accuracy, examples of experimental designs.

Chapter 13 (2 weeks)
13.1 – 13.11: Analysis of Variance (revisited) , Statistical Model for randomized block design, analysis of variance for randomized block design, selecting sample size.

Chapter 14 (1 week)
14.1 – 14.5 : Chi-square test, A goodness -of-fit-test, contingency table, rxc table with fixed row or column tables.

Chapter 15 (2 weeks)
15.1 – 15. 10 :General two sample shift Model, sign test, Wilcoxon Signed Rank Test, Mann-Whitney U test, Kruskal-Wallis Test, Frieman Test, Runs Test, Rank Correlation Coefficient.