SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Statistics)
Semester: IV
Syllabus with Effect from: June-2013

Paper Code: PS04CSTA01	**Total Credit: 4**
Title Of Paper: Computer Oriented Statistical Methods	

Unit	Description in Detail	Weightage (%)
I	**Generation Of Random Numbers From** Uniform, Binomoial, Poisson, Exponential, Weibull, Normal, Gamma, T, F, Multivariate Normal Distribution And Different Stochastic Processes Using Pseudo Random Number Generation Algorithms Like Linear Congruential Method (Lcg), Inverse Method, Rejection Method Etc.	25%
II	**Simulation Principles**: Rejection Method; Variance Reduction; Importance Sampling. **Simulation** Of Probability Distribution Of Different Statistics Using Monte Carlo And Similar Techniques. Estimation Of Bias, Mse And Other Statistics Using Bootstrap And Similar Techniques. **MCMC Algorithms:** Metropolis-Hastings Algorithm; Gibbs Sampling.	25%
III	**Logistic Regression Models:** Introduction; The Multiple Logistic Regression Model; Fitting The Logistic Regression Model; Testing For The Significance Of The Model. Application Of Logistic Regression In Study Of Matched Case Control Data. Cox's Regression Model: Proportional Hazard Model. Estimation And Tests Of Parameters Of The Proportional Hazard Model. Use Of This In Comparison Of Two More Life Distributions. Discriminant Analysis:	25%
IV	**Multivariate Techniques:** (I) Principal Component Analysis (Ii) Factor Analysis (Iii) Canonical Correlation (Iv) Cluster Analysis.	25%

Basic Text & Reference Books:-

- Fishman, G.S. (1996) Monte Carlo: Concepts, Algorithms, and Applications.(Springer).
- Rubinstein, R.Y. (1981); Simulation and the Monte Carlo Method. (Wiley).
- Tanner, M.A. (1996); Tools for Statistical Inference, Third edition. (Springer.)
- Efron, B. and Tibshirani. R.J. (1993); An Introduction to the Bootstrap. (Chapman and Hall).
- Shao J. and Tu, D. (1995); The Jackknife and the Bootstrap. Springer Verlag.
- McLachlan, G.J. and Krishnan, T. (1997) The EM Algorithms and Extensions. (Wiley.)
- Simonoff J. S. (1996) Smoothing Methods in Statistics. (Springer).
- William J., Kennedy, Jr. James E. Gentle (1980). Statistical Computing. Marcel Decker
- J. S. Liu (2001). Monte Carlo Strategies in Scientific Computing, Springer,
- Kshirsagar, A. M. (1972). Multivariate Analysis, Marcel Dekker, NY