Stat-413 Bio-Statistics

100 Marks: 03 Credits

Number of Class: 35-40

Lifetime Distributions: Survival Data, Probability density, hazard function, survival function, interrelationship, mean residual life function and median lifetime, some important lifetime distributions.

Incomplete data analysis: Types of censoring. Construction of likelihood function with censored data. Estimation of life parameters and their sampling variances from Exponential, Weibull, and extreme value distributions using type I and type II censored data.

Parametric Survival Distributions: Likelihood function of failure time data for different consoring mechanism exponential, two parameter exponential, weibull, lognormal, normal and gamma distributions, inference procedures (Estimation and tests for small and large samples).

Non-parametric Methods: Estimation of hazard and survival functions, actuarial and product-limit methods, standard errors, median survival time, tests, confidence intervals.

Comparison of Survival Curves: Comparison of Two Groups, Log-rank (Mantel-Haenszel) Test; Hazard ratios, confidence interval for hazard ratios, stratified log rank test, median survival, non-proportional hazards, other tests comparing two group, comparison of more than two groups.

Logistic Regression Model: Introduction to logistic regression, important special cases of logistic regression model, computing the odds ratio in logistic regression, maximum likelihood estimation statistical inferences ,modeling strategy for assessing interaction and confounding, analysis of matched data, logistic regression for care control data, polytomous logistic regression model.

Proportional Hazards Model: Proportional hazards model and its characteristics, evaluating proportional hazards assumptions, estimation procedures, stratified procedure, discrimination function analysis.

Text

1. Lawless, J.F,(2003): *Statistical Models and Methods for Lifetime data*, 2nd Ed, Wiley , New york
2. Lee.E.T.(1980): *Statistical Methods For survival Data Analysis,* Life Learning Publication, Belmont, California

References

1. Coz, D.R and Oakes, D,(1988): *Analysis of Survival data*, Chapman and hall
2. Daniel W.W: *Bio-statistics: A Foundation for Analysis in the Health Science,* 7th Ed. John Wiley and Sons, New York.
3. Joseph L. Fleiss: *Statistical methods For Rates of proportions*
4. Kalbflersch, J.D. and Prentice, R.L(2002): *The Statistical Analysis of failure Time Data*, Wiley, NewYork
5. Kalbflesch, J. D. and Prentice, R. L.: *The Statistical Analysis of Failure Time Data*, John Wiley New York.
6. Kleinbaum, D.G, (1996): *Survival Analysis,* Springer,New York.