STATISTICSINTERDISCIPLINARY

STAT-MD-IDC2-2-Th **2 Credits**

(Statistics for Practitioners) **THEORY**

Understanding univariate data: Variable, notion of population and sample, different types of data, methods of collecting primary and secondary data, presentation of data, summary measures on data with central tendency (arithmetic mean, median, mode), dispersion (range, quartile deviation, standarddeviation,coefficientofvariation),ideasofskewnessandkurtosis(onlythroughdiagrams), Exploratory Data Analysis. (8)

Understanding bivariate data: Paired data and ideas (without mathematical details) of different measures of associations, primarily Pearson's correlation coefficient, Spearman's Rank correlation (no tie), measures of association of attributes through contingency table, two-variable linear regression and multiple (three-variable only) linear regression (without derivation of the regression coefficients'formulae). (8)

StatisticalInference(*testingofhypothesis*):Basicideaofbinomialandnormalpopulations(graphical ideaonly,derivationofthepropertiesexcluded).Conceptsofhypotheses,knowledgeonteststatistic and decision making in terms of critical value and p-value for some standard testing problems like test for proportion/proportions, mean based on single (normal) sample, test on comparing means based on two-sample and paired sample data. (7)

Miscellaneous discussion: Applications of one-way and two-way ANOVA with one observation per cell(withoutderivationanddetails)assumingnormality,Kruskal-Wallistest(withoutderivationand details), sample size determination, estimation of population mean and variability for finite population,idea and application of logistic regression for binary esponse data. (7)

STAT-MD-IDC2-2-P
1Credit
(Statistics for Practitioners)PRACTICAL

List of Suggested Practical

- Measures of mean,median, mode,range,QD, SD,CV for univariate data case.
- Fitting of linear regression on bivariate and on three-variable multivariate data, measures of Pearson's correlation coefficient, Spearman's Rank correlation, measures of association of attributes through contingency table.
- Tests for proportion/ proportions,tests of means for single sample,two-sample,and paired sample data on normal response using p-value approach.
- Applications ofANOVA and Kruskal-Wallis test.
- Sample size determination,e stimation of population mean and variability for finite population.
- Fitting of logistic regression for binary response data.

ReferenceBooks:

- Gun,A.M.,Gupta,M.K.andDasgupta,B.(2008):FundamentalsofStatistics,Vol.I,9th Editio n World Press, Kolkata.
- Das,N.G.:Statistical Methods,VolI,TataMcGrawHillPub.Co.Ltd.
- Johnson,R.A.andWichern,D.W.:AppliedMultivariateStatisticalAnalysis, PHI.
- HardleW.andSimar,L.:AppliedMultivariateStatisticalAnalysis.
- Kutner,M.H.et.al.:AppliedLinearStatisticalModels.
- BelsleyD.A.et.al.:RegressionDiagnostics.
- DraperN.R.andSmith,H.:AppliedRegressionAnalysis.
- Roychowdhury,S.,Bhattacharya,D.:StatisticsTheoryandPractice,U.N.Dhur&Sons.Pvt.Lt d.
- Roychowdhury, S.,Bhattacharya,D.:ProbabilityandStatisticalInferenceTheoryandPractice, U.N.Dhur&Sons. Pvt. Ltd.