TRIPURA UNIVERSITY

(A Central University)
Suryamaninagar-799022

Syllabus

For

Semester – II

Statistics (Major & General)

Year 2014

Statistics Honours [2nd Semester]
Paper - II (Theory)

Total marks: 60 (12 Internal Assessment and 48 Theory)　　　　　　　Time: 2 Hours.

Unit –I (Probability Distributions)

Uniform, Bernoulli, Binomial, Poisson, Hypergeometric, Negative Binomial, Geometric and multinomial distributions their properties. Concept of truncated distributions.

Uniform, Exponential, Normal, Gamma, Beta, and Cauchy distributions. Definition of Bi-variate normal distribution and its properties.

Tchebycheff's Inequality. Weak law of large numbers (Bernoulli and Khintchine). Central limit theorem (i.i.d cases).

Transformations of statistics to stabilize variance. Derivations of $\sin^{-1}$, square root, logarithmic and Ztransformations

Unit – II (Correlation, Regression and Association of Attributes)

Bivariate data, Scatter diagram, Correlation coefficient and its properties. Rank correlation-Spearman's measure. Correlation ratio. Intraclass correlation (with equal group size).

Principle of Least squares. Concept of regressions, Regression lines, Important results relating to regression lines.

Independence and association of attributes. kinds of association. Coefficients of association.

References:

1. Chung K.L. (1983): Elementary Probability Theory with Stochastic Process, Springer / Narosa
2. Feller W. (1968): An Introduction to Probability Theory & its Applications, John Wiley
3. Goon A.M., Gupta M.K. & Dasgupta B. (1994): An Outline of Statistical Theory (Vol-1), World Press
4. Rohatgi V.K. (1984): An Intro. to Probability Theory & Math. Statistics, John Wiley
5. Hoel P.J., Port S.C. & Stone C.J. ( ): Introduction to Probability Theory (Vol-1), Mifflin & UBS
6. Cramer H. (1954): The Elements of Probability Theory, John Wiley
7. Parzen E. (1972): Modern Probability Theory and its Applications, John Wiley
8. Uspesky J.V. (1937): Introduction to Mathematical Probability, McGraw Hill
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9. Cacoullos T. (1973): Exercises in Probability. Narosa
10. Rahman N.A. (1983): Practical Exercises in Probability and Statistics, Griffen
11. Pitman J. (1993): Probability, Narosa
12. Stirzaker D. (1994): Elementary Probability, Cambridge University Press
13. Chandra T.K. & Chatterjee D. (2001): A First Course in Probability, Narosa
14. Bhat B.R. (1999): Modern Probability Theory, New Age International
15. Goon AM,Gupta MK,Dasgupta B.(1998):Fundamentals of Statistics (V-1),World Press

16. Yule G.U & Kendall M.G (1950): An Introduction to the Theory of Statistics. C.Griffin
17. Kendall M.G. & Stuart A. (1966): Advanced Theory of Statistics (Vols 1 & 2)
18. Snedecor & Cochran (1967): Statistical Methods (6th ed), Iowa State Univ. Press
19. Croxton F.E., Cowden D.J. & Klein (1969): Applied General Statistics, Prentice Hall
20. Wallis F.E. & Roberts H.V. (1957): Statistics- a new approach, Methuen
21. Lewis-Beck M.S. (edt.) (1993) : Regression Analysis, Sage Publications
22. Mukhopadhyay P. (1996): Mathematical Statistics. New Central Book Agency Pvt. Ltd., Calcutta.

Statistics Honours [2nd Semester]

Paper - II (Practical)

[Using Spreadsheet, SPSS, R]

Total marks: 40 (8 Internal Assessment and 32 Practical)   Time: 2 Hours.

1. Drawing of Bar-Diagram, Line-Diagram, Pie chart, Histogram, Frequency polygon, Ogives, Boxplots.
2. Construction of frequency distribution and computation of different measures of central tendency, dispersion, skewness & kurtosis.
3. Computation of bi-variate correlation coefficient, bi-variate linear regression equation & Spearman's rank
correlation coefficient.
4. Computation of Correlation ratio.
5. Computation of intraclass correlation coefficient.
6. Curve fitting by least square method: Linear, Polynomial, Inverse, Exponential and Growth curve.
7. Fitting of Binomial, Poisson & Normal Distribution.
8. Lagrange's Interpolation formula. Trapezoidal and Simpson's one third rules of integration. Solutions of
equations by the methods of Iteration, Bisection method and Newton-Raphson in one unknown.
NewtonRaphson
in
two
unknown
for
simultaneous
equation.

Statistics General Course [2nd Semester]
Paper II (Theory)
Total marks: 50 (10 Internal Assessment and 40 Theory)   Time: 2 Hours.

Unit –I (Probability Distributions)
Discrete Distributions: Uniform, Bernoulli, Binomial, Poisson, Geometric and Hypergeometric.
Continuous Distributions: Uniform, Exponential, Normal, Gamma and Beta. Definition of Bivariate normal distribution and its properties (without proof).
Tchebycheff's Inequality.
Sampling Distributions: Concepts of Random sampling, statistic and parameter. Sampling distribution of statistic and its Standard Error. Definitions and properties of Chi-square, t and F statistics.

Unit – II (Time Series Analysis, Index Numbers and Numerical Analysis)
Time Series Analysis: Components of time series. Additive and multiplicative models. Trend and seasonal components: Measurements of trend by Moving Average and Fitting Mathematical curves
by Least squares Method, Determination of seasonal indices by Method of simple Averages, by Method
of Trend Ratios and Ratio to moving averages.
Definition, Problems involved in the construction of index numbers. Different types of errors.
Criteria of a good index number. Price, quantity and value indices. Price index numbers: Construction (various formulae), uses and limitations. Tests for index numbers. Cost of living index and its uses and
major steps in its construction.
D, Δ and E operators. Definition of interpolation. Lagrange's interpolation formula. General quadrature formula. Trapezoidal and Simpson's one third rules of integration. Solutions of equations by
the methods of Iteration, and Newton-Raphson in one unknown.

References:
1. Goon A.M., Gupta M. & Dasgupta B.(1997): An Outline of Statistics(Vol 1), World Press
2. Feller W.(1968) : An Introduction to Probability Theory & its Applications, John Wiley
3. Cacoullos T. (1973): Exercises in Probability, Narosa
4. Bhattacharyya G. K. & Johnson R. A. (1977) : Concepts & Methods of Statistics, J.Wiley
5. Freund J.E. (2001): Mathematical Statistics, Prentice Hall
6. Pitman J. (1993): Probability, Narosa
7. Stirzaker D. (1994): Elementary Probability, Cambridge University Press
8. Rathie and Mathai: Probability and Statistics
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9. Mukhopadhyay P. (1999): Applied Statistics. New Central Book Agency Pvt. Ltd., Calcutta.
10. Croxton F. E., Cowden D. J. & Klein (1969): Applied General Statistics, Prentice Hall
11. Scarborough J.B. (1958): Numerical Mathematical Analysis, Oxford Univ. Press
12. Atkinson K. (1985): Elementary Numerical Analysis
13. Sastry S.S. (1998): Intriductory Methods of Numerical Analysis.

Statistics General Course [2nd Semester]

Paper II (Practical)
[Using Spreadsheet, SPSS, R]

Total marks: 50 (10 Internal Assessment and 40 Practical)   Time: 2 Hours.

1. Drawing of Bar-Diagram, Line-Diagram, Pie chart, Histogram, Frequency polygon, Ogives.
2. Computation of different measures of central tendency, different measures of dispersion, moments skewness & kurtosis.
3. Computation of bi-variate correlation coefficient, bi-variate linear regression equation & Spearman's

rank correlation coefficient.
4. Curve fitting by least square method: Linear, Parabola of 2

nd

degree, Exponential curve, Growth

curve.
5. Computation of seasonal indices by Simple average, Ratio to moving average & Link relative methods.
6. Fitting of Binomial, Poisson & normal distributions.
7. Computation of index numbers using Laspeyre's, Paasche's, Fisher's and Marshall-Edgeworth formulae. Time reversal and Factor reversal tests of index numbers.
8. Lagrange's interpolation formula. General quadrature formula. Trapezoidal and Simpson's one third rules of integration. Solutions of equations by the methods of Iteration, and Newton-Raphson in one unknown.