TRIPURA UNIVERSITY

(A Central University)
Suryamaninagar

SYLLABUS

OF

Statistics
(General and Major)

Semester-I

Year 2014

COURSE STRUCTURE OF STATISTICS (GENERAL)

Sl.No.	Semester	Paper	Marks
1	I	I	100 [Theory: 80 + IA*:20)
2	II	II	50 [Theory: 40 + IA:10) 50 [Practical: 40 + IA:10)
3	III	III	50 [Theory: 40 + IA:10) 50 [Practical: 40 + IA:10)
4	IV	IV	50 [Theory: 40 + IA:10) 50 [Practical: 40 + IA:10)
5	V	V	50 [Theory: 40 + IA:10) 50 [Practical: 40 + IA:10)

IA*: Internal Assessments

Statistics (General)
Semester I

Paper I (Theory)

Total Marks: 100 (20 Internal Assessments and 80 Theory) Time: 3 Hours.

Unit – I (Descriptive Statistics)

Introduction to Statistics: Definition, scope and Limitations of statistics, Use of statistics. Collection and classification of data: Primary data and secondary data, methods of collection of data, Scrutiny of data. Classification, principles of classification, types of classification.

Tabular presentations of data: Principles of tabulation, one-way and two-way tables, different types of tables. Diagrammatic representation of data: Graphs and diagrams, different types of graphs and diagrams, graphical presentations of a frequency distribution. Frequency distributions and it's constructions.

Concept of location, Different measures of locations. Empirical relationships between different measures. Concept of dispersion, Different measures of dispersion and their properties. Different typesof moments, relationships between them (upto 4th order). Sheppard's corrections for moments (without proof). Skewness, kurtosis and their measures.

Unit – II (Probability – I)

Random experiment, sample point, sample space, different types of events, Meaning of Probability, Classical, Statistical and Axiomatic definitions of probability. Limitation of classical definition of probability, Theorem on the probability of union of events. Conditional probability, Theorem on conditional probability, Statistical independence of events, Bayes' theorem and its application.

Unit – III (Probability – II)

Random variables: Definition of discrete and continuous random variables. Probability mass function (p.m.f.). Probability density function (p.d.f). Cumulative distribution function (c.d.f.) and its properties. Expectation and moments, Theorems on sum and product of expectations of variables. The p.m.f., p.d.f. and c.d.f. in the bivariate case. Marginal and conditional distributions. Independence, conditional expectation and conditional variance. Cauchy Schwartz inequality. Moment generating function (m.g.f)

Unit – IV (Correlation, Regression and association of attributes)

Bivariate data, Scatter diagram, Correlation coefficient and its properties. Rank correlation-Spearman's measure.

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.

Multiple linear regression, Multiple correlation, some results relating to multiple regression and multiple correlation (tri-variate cases).

Partial correlation, some relations connecting partial regression and partial correlation coefficients (tri-variate cases).

References

1. Goon A.M., Gupta M. & Dasgupta B.(2001) : Fundamentals of Statistics (Vol. 1), World Press

2. Yule G.U. & Kendall M.G.(1950) : Introduction to the Theory of Statistics, Charles Griffin

3. Goon A.M., Gupta M. & Dasgupta B.(1997): An Outline of Statistics(Vol 1), World Press

4. Feller W.(1968) : An Introduction to Probability Theory & its Applications, John Wiley

5. Cacoullos T. (1973): Exercises in Probability, Narosa

6. Freund J.E. (2001): Mathematical Statistics, Prentice Hall

7. Pitman J. (1993): Probability, Narosa

8. Stirzaker D. (1994): Elementary Probability, Cambridge University Press

9. Rathie and Mathai: Probability and Statistics

COURSE STRUCTURE OF STATISTICS (MAJOR)

Sl.No.	Semester	Paper	Marks
1	I	I	100 [Theory:80+IA*:20)
2	II	II	60 [Theory: 48 + IA:12) 40 [Practical: 32 + IA:08)
3	III	III	60 [Theory: 48 + IA:12) 40 [Practical: 32 + IA:08)
4	IV	IV	60 [Theory: 48 + IA:12) 40 [Practical: 32 + IA:08)
5	V	V VI	100 [Theory: 80 + IA:20) 100 [Practical: 80 + IA:20)
6	VI	VII VIII	100 [Theory: 80 + IA:20) 100 [Practical: 80 + IA:20)

IA*: Internal Assessments

Statistics (Major/Honours)

[Semester I]

Paper - I (Theory)

Total marks: 100 (20 Internal Assessment and 80 Theory) Time: 3 Hours.

Unit – I (Descriptive Statistics)

Introduction to Statistics: Definition, scope and Limitations of statistics, Use of statistics. Collection and classification of data: Primary data and secondary data, methods of collection of data, Scrutiny of data. Classification, principles of classification, types of classification.

Tabular presentations of data: Principles of tabulation, one-way and two-way tables, different types of tables. Diagrammatic representation of data: Graphs and diagrams, different types of graphs and diagrams, graphical presentations of a frequency distribution. Frequency distributions and it's constructions.

Concept of central tendency, Different measures of central tendencies. Empirical relationships between different measures. Concept of dispersion, Different measures of dispersion and their properties. Different types of moments, relationships between them (upto 4th order). Sheppard's corrections for moments (without proof). Skewness and kurtosis and their measures. Boxplot.

Unit – II (Probability – I)

Random experiment, sample point, sample space, different types of events, Meaning of Probability, Classical, Statistical and Axiomatic definitions of probability. Limitation of classical definition of probability, Theorem on the probability of union of events. Conditional probability, Theorem on conditional probability, Statistical independence of events, Bayes' theorem and its application.

Unit – III (Probability – II)

Random variables: Definition of discrete and continuous random variables. Probability mass function (p.m.f.). Probability density function (p.d.f). Cumulative distribution function (c.d.f.) and its properties. Expectation and moments, Theorems on sum and product of expectations of variables. The p.m.f., p.d.f. and c.d.f. in the bivariate case. Marginal and conditional distributions. Independence, conditional expectation and conditional variance. Cauchy Schwartz inequality.

Generating functions: Moment generating function (m.g.f.) and Probability generating function (p.g.f). Definition and properties of Characteristic function.

Unit – IV (Numerical Analysis)

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, Bisection method and Newton-Raphson in one unknown. Convergence and geometric significance of Iteration method and Newton-Raphson method. Newton-Raphson in two unknown for simultaneous equation. Stirling's approximation to n!.

References:

1. Goon A.M.,Gupta M. K., Dasgupta B.(1998): Fundamentals of Statistics (V-1),World Press
2. Yule G.U & Kendall M.G. (1950): An Introduction to the Theory of Statistics, C.Griffin
3. Snedecor & Cochran (1967): Statistical Methods (6th ed), Iowa State Univ. Press
4. Sastry S.S(1987): Introductory Methods of Numerical Analysis, Prentice Hall.
5. Wallis F.E. & Roberts H.V. (1957): Statistics- a new approach, Methuen
6. Tukey J.W. (1977): Exploratory Data Analysis, Addison-Wesley Publishing Co.
7. Chung K.L. (1983): Elementary Probability Theory with Stochastic Process, Springer / Narosa
8. Feller W. (1968): An Introduction to Probability Theory & its Applications, John Wiley
9. Goon A.M., Gupta M.K. & Dasgupta B. (1994): An Outline of Statistical Theory (Vol-1), World Press
10. Rohatgi V.K. (1984): An Intro. to Probability Theory & Math. Statistics, John Wiley
11. Hoel P.J., Port S.C. & Stone C.J. ( ): Introduction to Probability Theory (Vol-1), Mifflin & UBS
12. Cramer H. (1954): The Elements of Probability Theory, John Wiley
13. Parzen E. (1972): Modern Probability Theory and its Applications, John Wiley
14. Uspensky J.V. (1937): Introduction to Mathematical Probability,McGraw Hill
15. Cacoullos T. (1973): Exercises in Probability. Narosa
16. Rahman N.A. (1983): Practical Exercises in Probability and Statistics, Griffen
17. Pitman J. (1993): Probability, Narosa
18. Stirzaker D. (1994): Elementary Probability, Cambridge University Press
19. Chandra T.K. & Chatterjee D. (2001): A First Course in Probability, Narosa
20. Bhat B.R. (1999): Modern Probability Theory, New Age International
21. Scarborough J.B. (1958): Numerical Mathematical Analysis, Oxford Univ. Press