GOVERNMENT DEGREE COLLEGE, BARAMULLA

Semester: 3rd **Major/Minor**

Department of Statistics

Title: Introduction to Statistical Methods Code: BST22C301
Credits: 6 (4 th + 2 Pr) Contact Hours: 64 th + 64 Pr

Course Objectives: To introduce the basic concepts of Multiple and Partial (Correlation and Regression).

To introduce the basic elements of categorical data.

To introduce basic concepts of computers and its applications in Statistics.

Course Outcome: After completing the course, students will have**:**

- Ability to measure multiple and partial correlation of data and define its significance.
- Ability to measure multiple and partial Regression of data and define its significance
- Ability to predict value of dependent variable in case of straight line and second degree parabola for data set.
- Ability to obtain frequencies and class frequencies

THEORY (4 Credit)

Unit I: Multiple and Partial correlation: 16 Hrs

Concept of multiple correlation and multiple regression and its Importance (upto three variables), Partial correlation and partial regression and its Importance. Yules notation, residual, Properties of residuals without proof, Coefficient of multiple correlation and partial correlation. Multiple correlation in terms of total and partial correlation. Important properties of multiple correlation coefficient (without proof).

Unit II: Curve Fitting: 16 Hrs

Concept of dependent and independent variable, Types of curves, Method of least square for fitting straight line, fitting of parabola, fitting of exponential curvey $= ab^x$. Fitting of Power curve of the form $y = ax^b$ and related examples. Free-hand method of curve fitting.

Unit III: Analysis of Categorical Data: 16 Hrs

Level of Measurements, Notations, Classes and class frequencies, order of classes, Relation between class frequencies, Consistency of categorical data, Independence of attributes, Association of attributes, Yule's coefficient of association, Coefficient of colligation.

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Unit IV: Introduction to Computers: 16 Hrs

Application of Computers in Statistics, Basics of Excel: Data Entry Built in Functions in Excel (Mathematical and Statistical), Graphical Representation of Data through Excel (Histogram, Bar Diagram, Box Plot, Steam & leaf).

Practical (2 Credits)

1. Multiple and Partial Correlation (upto three variables only).
2. Multiple and Partial Regression (upto three variables only).
3. Fitting of 1st degree line to the data set.
4. Fitting 2nd degree parabola to the data set.
5. Predicting value of dependent variable in case of straight line and second degree parabola for data set.
6. Obtaining frequencies and class frequencies.
2. Association of attributes for the data set.
3. Use excel work sheet for different data sets

Books Recommended:

1. Statistics: A Beginners Text Vol. I. New Age International Ltd.

2. Goon, A.M., Gupta, M.K. and Dasgupta, B. (2013). Fundamental of Statistics, Vol I, World Press,
Kolkata.

3. Gupta, S.C. and Kapoor, V.K. (2000). Fundamentals of Mathematical Statistics (10th ed.), Sultan
Chand and Sons.

4. Das N,G. Statistical Methods Vol I, McGraw Hill Education India.

5. S.P Gupta. Statistical Methods, Sultan Chand and Sons.

6. Pardeep, K. Sinha and Priti Sinha. Computer Fundamentals, BPB Publications (2004)

Semester: 3rd **Skill Enhancement Course**

Department of Statistics

Title: Applied Statistics-III and SPSS Code: BST22S302

Credits: 4 (2 th + 2 Pr) Contact Hours: 32 th + 64 Pr

Course Objectives: To introduce the skill of SPSS to study the hypothesis testing.

Course outcomes: To equip students with theoretical and analytical skills with the apability to understand and handle

The dynamic of statistics in the business world.

Students will have ability to express thoughts and ideas effectively in Statistical language.

The students could develop Statistical reasoning to analyse and interpret socio economic data from a variety of sources.

The students will be able to equip themselves within depth SPSS software for statistical computing.

Unit I: Hypothesis: 16 Hrs

Null hypothesis and alternative hypothesis, critical region, one tail and two tail test, level of significance, p value, procedure for testing of hypothesis. Computational techniques for t test for single mean, difference between two means and paired t test for difference between means.

Unit II: Computational techniques: 16 Hrs

F – Statistics or Variance Ratio Test , One way Analysis of variance (ANOVA), Post hoc test, Computational technique for Chi square test for goodness of fit; independence of attributes and test for specified value of population variance.

Practical: (2 credits) 32 Hr

1. Determination of Critical value for one tail test and two tail test through SPSS.
2. Test of significance of Single and difference of means using SPSS.
3. Test of Significance of paired t test for difference between means through SPSS.
4. Test of significance of Chi square test for goodness of fit.
5. Test of significance of chi square test for independence of attribute through SPSS.

Books Recommended:

1. Handbook of Statistical Analysis using SPSS by sabine Landau and Brians. Everitt published by Chapman and Hall/crc
2. Data Analysis using SPSS, first edition by Lokesh Jasrai published by Saja Publications India Pvt.Lt.
3. S.P. Gupta: Statistical Methods by Sultan chand and Sons
4. Data Analysis using SPSS by Dr. Lalit Prasad and Dr. Priyanka Mishra , Nirali Publications
5. Link :www.iasri.res.in

Govt. Degree College Baramulla

Department of Statistics

MULTIDISCIPLINARY COURSE (Syllabus) **CREDITS: 03**

BST22M103: STATISTICS (BASIC STATISTICS)

Course outcomes: After completing this course a student will have:

- *Knowledge of Statistics, its scope and importance in various fields.*
- *Ability to understand concepts of samples. Population and difference between different types of data.*
- *Knowledge of methods for summarizing data sets, including common graphical tools (such as box plots, histograms and stem plots).Interpret histograms and box plots.*
- *Ability to describe data with measures of central tendency and measures of dispersion.*

UNIT-I

Introduction to Statistics and Basic Concepts*:*

Meaning, origin, definition, functions, limitations and applications of Statistics. Primary and secondary data, different methods of collection of primary data with merits and demerits. Sources of secondary data. Classification: meaning, objectives, types of classifications- Chronological, Geographical, Qualitative and Quantitative classifications with illustrations. Formation of discrete and continuous frequency distributions.

Tabulation: meaning, objectives and rules of tabulation, format of a statistical table and its parts. Types of table, examples of preparation of a blank table and tables with numerical information.

Diagrammatical Graphical representation of Data: Diagrams: Meaning, importance of diagrams and general rules of construction of diagrams. Types of Diagrams - simple, multiple, component, percentage bar diagrams and pie diagrams with simple illustrations.

Graphs: Types of Graphs-Histogram, frequency Polygon, frequency curve and ogives, simple problems, location of mode, median and partition values from the graphs. Difference between diagrams and graphs.

UNIT-II

Measures of Central Tendency:

Meaning of central tendency and essentials of a good measure of central tendency. Types of measures of central tendency: Arithmetic mean, Median, Mode, Geometric mean and Harmonic mean - definition, merits and demerits.Properties of arithmetic mean.Problems on both grouped and ungrouped data for all the measures.

UNIT-III

Measures of Dispersion:

Meaning and objectives of measures of dispersion. Essentials of a good measure of dispersion, absolute and relative measures of dispersion. Types of measures of dispersion- Range, Quartile deviation, Mean deviation and standard deviation with relative measures-definition, merits and demerits. Simple problem on ungrouped and grouped data.

References:

1. Gupta S.C.Fundamentals of Statistics,Himalaya Publishing House, Bombay
2. Mukhopadhaya,P.Applied Statistics, New Central Book Agency(P)Ltd.,Calcutta
3. Gupta S.P.and V.K Kapoor Fundamentals of Mathematical Statistics, Sultan Chand,New Delhi
4. Goon,A.M.,Gupta,M.K. and Das Gupta,B. (2013).Fundamental of Statistics,VolI, World Press , Kolkata.
5. Goon, A.M.,Gupta,M.K.and Das Gupta,B.(2011).Fundamental of Statistics,Vol II,World Press,Kolkata.
6. Gupta, S.C. and Kapoor, V.K. (2000). Fundamentals of Mathematical Statistics (10th ed.), Sultan Chand and Sons.
7. Hanagal, D. D. (2009). Introduction to Applied Statistics: A Non-Calculus Based Approach. Narosa Publishing Comp. New Delhi.
8. Miller,I.and Miller, M. (2006).John E.Freund's Mathematical Statistics with Applications,(7thEdn.), Pearson Education, Asia.
9. Mood, A.M. Graybill, F.A. and Boes, D.C. (2011). Introduction to the Theory of Statistics, 3rd Edn., Tata McGraw-Hill Pub. Co.Ltd.
10. Weatherburn, C.E. (1961). A First Course in Mathematical Statistics, The English Lang. Book Society and Cambridge Univ. Press.