

**Govt. College for Women, Parade  
(An Autonomous College)**



**Syllabus of the Subject: Statistics**

**for Semesters III-VI**

**of**

**Three Years Under-Graduate Programme**

**Under CBCS**

**Nov. 2021**

**Syllabus for B.A. /B.Sc. Statistics (Semester III) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Data Processing through MS Office  
**Course Code:** USTTS- 301

**Total Marks:** 50  
**Internal Examination:** 10 Marks  
**External Examination:** 40 Marks

**Credits:** 02

**Objectives:** The objective of the course is to expose the students to the real life Skills for Statistical Computing, Analysis and Graphical Interpretation using Software Skills viz., MS Word and Excel

**Unit-I**

- a) Introduction to Computers: Historical evolution of Computers. Generations of Computers, Classification of Computers, Applications of Computers.
- b) Computer Memory: Primary and Secondary Memory, Hardware: CPU, I/O Devices, Block diagram.
- c) Introduction to System Softwares like Window, Unix, Mac, Linux.
- d) Word Processing: Creating and Saving a Document, Editing The Text: Printing, Saving and Importing Documents.

**Unit-II**

- a) Basics of Excel: Data Entry, Manipulating the data, Sorting of data.
- b) Built in Functions in Excel. Random Number Generation.
- c) Graphical Representation of data by Histograms, Frequency Polygon. Pie Chart, Ogive, Box Plot and Stem- leaf.
- d) Measures of Central Tendency, Partition Values and Measures of Dispersion.

**Books Recommended:**

1. V Rajaraman: Fundamentals of Computers. PHI.
2. Sanders, H.D.: Computer Today, Mc Graw Hill.
3. Gupta Vikram, Bhatia S.S, Thakur P.S., Sharma Vinus: Computer Fundamentals And It Tools. Kalyani Publishers
4. S.P Gupta: Statistics. S Chand and Co.
5. Brend Held (2007): Microsoft Excel Functions and Formulas. Wordware Publishing. Inc.
6. E. Balagurusamy (2009): Fundamentals of Computers. Mc Graw Hill Education.
7. Reema Thareja (2014): Fundamentals of Computers. Oxford.
8. Anita Goel (2010): Computer Fundamentals. Pearson; 1st edition.
9. D. Remenyi, G. Onofrei. J. English (2011): An introduction Statistics Using Microsoft Excel.. Academic Publishing Limited.
10. Archit Gulia and Shahbaz Alam (2021-2022): Basic Computer Course. Super Success Institute Muzaffarnagar.

## **Scheme of Examination**

### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A, B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each. 1.5 questions shall be set from each unit of the prescribed course content. Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester III) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing Using MS Office- V  
**Course Code:** USTPS- 301

**Total Marks:** 50  
**Internal Examination:** 25 Marks  
**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-301.

**List of Practical:** Practicals based on

1. Histogram, Stem and Leaf plot, Box plot.
2. Frequency polygon, pie chart, bar graphs.
3. Line charts.
4. Ogive, Frequency curve.
5. Measures of Central tendency.
6. Measures of Dispersion.
7. Skewness and Kurtosis.
8. Fitting of Polynomials and Exponential Curves.
9. Correlation Coefficient and Regression.
10. Generate a random sample from Binomial, Poisson, Uniform and Normal distribution.

### **Evaluation Strategy**

#### **Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses. 5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

#### **External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.

**Syllabus for B.A. /B.Sc. Statistics (Semester III) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Regression Analysis  
**Course Code:** USTTS- 302

**Total Marks:** 50  
**Internal Examination:** 10 Marks  
**External Examination:** 40 Marks

**Credits:** 02

**Objectives:** The objective of the course is to expose the students to the real life skills for statistical computing and analysis.

**UNIT-I**

- a) Concept of correlation and its types and properties.
- b) Methods of correlation- rank correlation equal and unequal ranks.
- c) Concept of regression- linear, non linear regression, - regression lines.
- d) Regression coefficient, properties of regression coefficients, illustrate with examples.

**UNIT-II**

- a) Curve fitting methods - liner equations- methods of least square illustrate with examples.
- b) Regression Curves – Conversion of data into linear form (power curve, exponential curves)
- c) Growth curve fittings – Exponential, Gompertz.
- d) Logistic curves.

**Books Recommended:**

1. Fundamentals of Mathematical Statistics (2020) – S.C.Gupta and V.K. Kapoor
2. Mathematical Statistics – J.N .Kapoor and H.C. Saxena (1989)
3. Introduction to Mathematical Statistics –R.V. Hogg and A.T .Craig (1989).
4. Statistical Methods 43rd Edition - S. P. Gupta (2014).
5. Fundamentals of Statistics For Business and economics (2005)- V.K. Kapoor. Sultan Chand and Sons.
6. Correlation and Regression Analysis: A Historian's Guide-Thomas J. Archdeacon. University of Wisconsin Press.
7. Regression Analysis: An Intuitive Guide for Using and Interpreting Linear Models- Jim Frost. Statistics by Jim Publishing (2020).
8. Basic Statistics- B.L. Aggarwal. New Age International Pvt. Ltd. Publishers.

## **Scheme of Examination**

### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A, B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each. 1.5 questions shall be set from each unit of the prescribed course content. Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester III) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing- VI  
**Course Code:** USTPS- 302

**Total Marks:** 50  
**Internal Examination:** 25 Marks  
**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-302.

**List of Practical:** Practicals based on

1. Scatter Diagram Method.
2. Correlation by Karl Pearson's method.
3. Correlation by Spearman's Method (Equal and Unequal Cases).
4. Fitting of Regression Lines (Y on X) and (X on Y).
5. Regression Coefficients.
6. Curve Fitting by the Method of Least Square.
7. Conversion of Power Curves.
8. Conversion of Exponential Curves.

**Evaluation Strategy**

**Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses. 5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

**External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.

**Syllabus for B.A. /B.Sc. Statistics (Semester IV) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Computational Skills Using R

**Course Code:** USTTS- 401

**Total Marks:** 50

**Internal Examination:** 10 Marks

**External Examination:** 40 Marks

**Credits:** 02

**Objectives:** The objective of the course is to expose the students to the real life skills for statistical computing, analysis and graphical interpretation using R. Hands on training on the following problems can be done on any of the statistical software to enhance data analysis skills.

**Unit-I**

- a) Concept and types of Data: Concepts of a statistical population and sample from a population; qualitative and quantitative data; nominal and ordinal data.
- b) Time series data; discrete and continuous data; frequency and non- frequency data.
- c) R data frames. Loading data files into R. Merging and aggregating data frames.
- d) R base graphics. The ggplot2 package for graphics.

**Unit-II**

- a) Fitting of Probability distributions: Binomial, Poisson and Normal Distributions.
- b) Correlation: Calculation of correlation coefficient, Rank Correlation along with their applications.
- c) Regression: Linear and Non- Linear Regression, Regression lines, Fitting of Polynomials and Regression Curves.
- d) Testing of hypothesis: Basic concepts, Errors, t, z, f and Chi –square test. Applications of Chi-square, t, z and F distributions.

**Books Recommended:**

1. Jared Lander : R for Everyone: Advanced Analytics and Graphics
2. Norman Matloff : The Art of R Programming: A Tour of Statistical Software Design
3. Andy Field: Discovering Statistics Using R. Sage publications.
4. Tilman M. Davies :The Book of R: A First Course in Programming and Statistics
5. Michael J. Crawley : The R Book
6. Mark Gardener :Beginning R: The Statistical Programming Language
7. Richard Cotton : Learning R: A Step-by-Step Function Guide to Data Analysis



## **Scheme of Examination**

### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A, B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each. 1.5 questions shall be set from each unit of the prescribed course content. Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester IV) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing with R-VII  
**Course Code:** USTPS- 401

**Total Marks:** 50  
**Internal Examination:** 25 Marks  
**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-401.

**List of Practicals:** Practical based on

1. Histogram, Stem and Leaf plot, Box plot frequency polygon, pie chart, bar graphs, line charts, Ogive, Frequency curve.
2. Measures of Central tendency.
3. Measures of Dispersion.
4. Skewness and Kurtosis.
5. Fitting of polynomials, exponential curves.
6. Correlation coefficient and Regression.
7. Generate a random sample from Binomial, Poisson & Normal distribution.
8. Fitting of Binomial distribution, Poisson distributions and normal distribution.
9. Tests based on Chi-Square Distribution- t-Distribution and F- Distribution.

**Evaluation Strategy**

**Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses. 5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

**External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.

**Syllabus for B.A. /B.Sc. Statistics (Semester IV) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Non-Parametric Tests

**Course Code:** USTTS-402

**Total Marks:** 50

Internal Examination: 10 Marks

External Examination: 40 Marks

**Credits:** 02

**Objectives:** The objective of the course is to expose the students to get skilled in NP tests.

**Unit-I**

- a) Introduction of non-parametric test– its comparison with parametric test– Advantage and limitations of non-parametric tests.
- b) Sign test for large and small samples.
- c) Test for randomness – Run test.
- d) Test for rank correlation co-efficient.

**Unit-II**

- a) Comparison of two populations: median test – Mann Whitney U test – Wilcoxon signed rank test for paired observations.
- b) Comparison of several populations: Median test for several samples – Kruskal Wallis test.
- c) Testing of goodness of fit by Kolmogorov – Smirnov test, Chi-Square test.
- d) Distinction between non-parametric and distribution free tests.

**Books Recommended:**

1. J.D.Gibbons (1976): Non-parametric methods for quantitative analysis, New York.
2. J.V.Desphande , A.P.Gune, A.Shanubhogur: Statistical Analysis of non-normal data.
3. Richard I. Lerin: Statistics for Management, Practice Hall of India, New Delhi.
4. Myles Hollander, Douglas A. Wolfe, Eric Chicken: Nonparametric Statistical Methods, 3rd Edition. Wiley Series.
5. Peter Sprent: Applied Nonparametric Statistical Methods. Springer, Dordrecht.
6. Larry Wasserman: All of Nonparametric Statistics. Springer, New York.
7. John Kolassa: An Introduction to Nonparametric Statistics. Chapman and Hall/CRC. Bhattacharya
8. Bhattacharya: Nonparametric Statistical Methods. Medtech.

## **Scheme of Examination**

### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A, B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each. 1.5 questions shall be set from each unit of the prescribed course content. Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester IV) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing- VIII  
**Course Code:** USTPS- 402

**Total Marks:** 50  
**Internal Examination:** 25 Marks  
**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-402.

**List of Practical:** Practicals based on

- 1) Sign Test for Small and Large Samples.
- 2) Run Test for Small and Large Samples.
- 3) Wald Wolfowitz run test.
- 4) Wilcoxon Signed Rank Test.
- 5) Mann Whitney U Test.
- 6) Median Test.
- 7) Kruskal Wallis Test.
- 8) Test for Significance of Rank Correlation Coefficient.
- 9) Kolmogrov-Smirnov Test.

**Evaluation Strategy**

**Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses. 5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

**External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.

**Syllabus for B.A. /B.Sc. Statistics (Semester V) Under CBCS  
GCW Parade College Jammu  
(Discipline Specific)**

**Title:** Applied Statistics -1  
**Course Code:** USTDSE- 501

**Total Marks:** 100  
**Internal Examination:** 20 Marks  
**External Examination:** 80 Marks

**Credits:** 04

**Objectives:** The main objective of this course is to provide the knowledge to the students about applied Statistics so that the Students can apply Statistical tools in day to day life.

**Unit- I**

Introduction to times series data, application of time series from various fields, Components of a times series, Decomposition of time series. Trend: Estimation of trend by free hand curve method, method of semi averages, fitting a various mathematical curve, and growth curves. Seasonal Component: Estimation of seasonal component by Method of simple averages, Ratio to Trend. Ratio to Moving Averages and Link Relative method, De-seasonalization.

**Unit- II**

Index Numbers: Definition, construction of index numbers and problems thereof for weighted and unweighted index numbers including Laspeyre's, Paasche's, Edgeworth-Marshall and Fisher. Factor reversal and time reversal tests. Chain index numbers, conversion of fixed based to chain based index numbers and vice-versa. Consumer price index numbers.

**Unit- III**

Laws of demand and supply, price elasticity of demand, Analysis of income and allied size distribution: Pareto distribution. Graphical test, fitting of Pareto law, Log- Normal distribution and its properties. Lorenz Curve and Gini's coefficients.

**Unit- IV**

Computational techniques: difference table and method of interpolation, Newton and Langrange's method of interpolation, divided difference, numerical differentiation and integration. Trapezoidal rule. Simpson $1/3$  and  $3/8$  rule.

**Unit-V**

Econometrics: Definition, Scope and Goal of Econometrics; Specification of the model; Variables in mathematical form of the model, Simple Regression Analysis, Stochastic and Non-Stochastic, Estimation of Regression Parameters, Least Square Estimation and its Properties.

**Books Recommended:**

1. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
2. Gupta, S.C. and Kapoor, V. K. (2020): Fundamentals of Applied Statistics, 4th Ed. (reprint), Sultan Chand and Sons.
3. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw-Hill Pub. Co. Ltd.
4. Kendall M.G. (1976): Time Series. Charles Griffin.
5. Chatfield C. (1980): The Analysis of Time Series –An Introduction, Chapman & Hall.
6. Mukhopadhyay P. (2011): Applied Statistics, 2nd ed. Revised reprint, Books and Allied.
7. Bhattacharya: Nonparametric Statistical Methods. Medtech.
8. Statistical Methods 43rd Edition - S. P. Gupta (2014).
9. Basic Statistics- B.L. Aggarwal. New Age International Pvt. Ltd. Publishers.
10. Sandeep Garg- Introductory Macro Economics. Dhanpat Rai Publications.
11. Madnani GMK-Introduction to Econometrics. CBS Publisher and Distributors. 8<sup>th</sup> Edition.

**Scheme of Examination**

<b>Theory</b>	<b>Syllabus to be covered in the examination</b>	<b>Time Allotted</b>	<b>% Weight age (Marks)</b>
Internal Assessment Test	Up to 40% (after 45 days)	1 hour	15% (15 marks) + 5%(5 marks of Attendance)
External End Semester Exam	Up to 100% (after 90 days)	3 hour	80
Total			100

### **Evaluation/Examination Pattern**

#### **Internal Assessment Test**

**Time: - 1 Hour**

**Marks: 15**

#### **Section A**

**5 Marks**

5 very short answer type question of 1 mark each covering 40% of the syllabus, set across all units (at least 2) covered.

#### **Section B**

**10 Marks**

2 long answer type question of 5 marks each to be attempted with internal choice, set from each unit.

#### **External End Semester Examination**

**Time: 3 hours**

**Marks: 80**

#### **Section A**

**Marks: 15**

5 short answer compulsory questions of 3 marks each representing all unit/syllabi i.e., at least one question from each unit having 70-80 words answer.

#### **Section B**

**Marks: 35**

5 medium answer compulsory questions of 7 marks each, at least one question set from each unit having 250-300 words answer.

#### **Section C**

**Marks: 30**

2 long answer type questions of 15 marks each to be attempted from 5 given questions set from all units of the syllabus having 500-600 words answer.



**Syllabus for B.A. /B.Sc. Statistics (Semester V) Under CBCS  
GCW Parade College Jammu  
(Discipline Specific)**

**Title:** Statistical Computing-IX  
**Course Code:** USTDSP- 501

**Total Marks:** 50  
**Minor Test:** 25 Marks  
**Major Test:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. There shall be at least fifteen computing exercises covering the applications of Statistics based on the entire syllabus of course no.USTDSE-501.

**LIST OF PRACTICALS:** Practical based on

1. Time Series.
2. Index Numbers.
3. Demand and Analysis.
4. Numerical Integration.
5. Econometrics.

**Evaluation/Examination Pattern**

Assessment in Practical on the basis of day to day performance in the Laboratory:	12 Marks
Practical Internal Assessment Test:	08 Marks
Attendance:	05 Marks
(75% to 80% = 02 marks, 80% to 85% = 03 marks, 85% to 90% = 04 marks, above 90% = 05 marks)	
Practical External Assessment:	20 Marks
Viva-Voce Examination:	05 Marks

**Syllabus for B.A. /B.Sc. Statistics (Semester V) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Research Methodology & Statistical Analysis

**Course Code:** USTTS -501

**Total Marks:** 50

Internal Examination: 10 Marks

External Examination: 40 Marks

**Credits:** 02

**Objectives:** The objective of the course is to expose the students to the real life Skills for Research Methodology. The course would have emphasis on the collection of data and various techniques to analysis the data and interpretation of results thereafter.

**Unit- I**

- a) Introduction: meaning, objectives and motivation in research, types of research, research approach, Significance of research and Criteria of a good research.
- b) Research problems: Definition, selection and necessity of research problems, techniques involved in defining a research problem.
- c) Survey methodology: Principal Steps and Principles of sample survey, Sampling and Non-Sampling errors, Advantages, Limitations and Types of Sampling.
- d) Selection of Simple random sample, Pilot Survey completes enumeration versus sample enumeration, Random and Non-Random Sampling (Concept Only).

**Unit- II**

- a) Data Collection and Preparation: Introduction, Primary data and Secondary data, Questionnaire and Schedule, Guidelines for constructing Questionnaire/Schedule.
- b) Classification, Tabulation, and Graphical Representation of data.
- c) Measure of Central tendency, Measure of Dispersion, Skewness and Kurtosis, Correlation and Regression.
- d) Null and Alternative hypothesis, Simple and Composite hypothesis, Errors, Level of Significance, p-value. Testing of hypothesis: single mean and single variance, Equality of Mean and Variance. One way ANOVA. Report Writing.

**Books Recommended:**

1. Kothari, C.R. (2004): Research Methodology: Methods and Techniques, 2<sup>nd</sup> Revised Edition, New Age International Publishers.
2. Kumar, R (2011): Research Methodology: A Step - by - Step Guide for Beginners, SAGE publications.
3. Gupta, S.P.: Statistical Methods
4. Kothary,C.R and Garg Gaurav (2019): Research Methodology Methods and Techniques, 4th Edition, New Age International Publishers.
5. Pagadala Suganda Devi: Research Methodology: A Handbook for Beginners. Notion Press; 1st edition (4 September 2017).
6. Tan Willie Chee Keong: Research Methods: A Practical Guide For Students And Researchers. World Scientific Publishing Co Pte Ltd.
7. Sharan B. Merriam, Elizabeth J. Tisdell: Qualitative Research: A Guide to Design and Implementation, 4th Edition. Jossey-Bass.
8. John W Creswell: Research Design: Qualitative, Quantitative and Mixed Methods Approaches 4th Edition

## **Scheme of Examination**

### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A, B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each. 1.5 questions shall be set from each unit of the prescribed course content. Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester V) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing-X  
**Course Code:** USTPS- 501

**Total Marks:** 50  
**Internal Examination:** 25 Marks  
**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-501.

**List of Practical:** Practicals based on

- 1) Sample with SRS.
- 2) Sample with SRSWR.
- 3) Measures of Central Tendency.
- 4) Dispersion.
- 5) Correlation.
- 6) Regression.
- 7) t-test.
- 8) Chi-square test.
- 9) F-test.
- 10) Z (large sample test).

**Evaluation Strategy**

**Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses. 5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

**External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.

**Syllabus for B.A. /B.Sc. Statistics (Semester V) Under CBCS  
GCW Parade College Jammu  
(Generic)**

**Title:** STATISTICS METHODS  
**Course Code:** USTTGE-501

**Total Marks:** 100  
**Internal Examination:** 20 Marks  
**External Examination:** 80 Marks

**Credits:** 04

**Objectives:** The main aim of this course is to acquaint Students to different types of Scales, measure of central tendency, different types of Correlation, Regression and ANOVA.

**Unit- I**

Introduction: Definition and scope of Statistics, concepts of statistical population and sample. Data: quantitative and qualitative, attributes, variables, scales of measurement - nominal, ordinal, interval and ratio. Presentation: tabular and graphic, including histogram and Ogive.

**Unit- II**

Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis.

**Unit- III**

Bivariate data: Scatter diagram, Correlation. Karl Pearson coefficient of correlation, Spearman's rank correlation coefficient. Principle of least-square and fitting of polynomials and exponential curves.

**Unit- IV**

Regression, Lines of regression, Regression coefficients with properties. Multiple and Partial correlations: Derivation & Simple illustration.(for 3 variables only).

**Unit- V**

Concept of Analysis of Variance(ANOVA) for one way classification, Terminology, Basic Principles of Design of Experiment, Concept and Analysis of C.R.D. Advantages and Disadvantages of C.R.D.

**Books Recommended:**

1. J.E. Freund (2009): Mathematical Statistics with Applications, 7th Ed., Pearson Education.
2. A.M. Goon, M.K. Gupta and B. Dasgupta (2005): Fundamentals of Statistics, Vol. I, 8th Ed., World Press, Kolkatta.
3. S.C. Gupta and V.K. Kapoor (2007): Fundamentals of Mathematical Statistics, 11th Ed., Sultan Chand and Sons.
4. R.V. Hogg, A.T. Craig and J.W. Mckean (2005): Introduction to Mathematical Statistics, 6th Ed., Pearson Education.
5. A.M. Mood, F.A. Graybill and D.C. Boes (2007): Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw Hill Publication.
6. S. P. Gupta (2014): Statistical Methods 43rd Edition.
7. B.L. Aggarwal: Basic Statistics. New Age International Pvt. Ltd. Publishers.
8. Gupta, S.C. and Kapoor, V. K. (2020): Fundamentals of Applied Statistics, 4th Ed. (reprint), Sultan Chand and Sons.

### Scheme of Examination

<b>Theory</b>	<b>Syllabus to be covered in the examination</b>	<b>Time Allotted</b>	<b>% Weight age (Marks)</b>
Internal Assessment Test	Up to 40% (after 45 days)	1 hour	15% (15 marks) + 5% (5 marks of Attendance)
External End Semester Exam	Up to 100% (after 90 days)	3 hour	80
Total			100

### Evaluation/Examination Pattern

#### Internal Assessment Test

**Time: - 1 Hour**

**Marks: 15**

#### Section A

**5 Marks**

5 very short answer type question of 1 mark each covering 40% of the syllabus, set across all units (at least 2) covered.

#### Section B

**10 Marks**

2 long answer type question of 5 marks each to be attempted with internal choice, set from each unit.

#### External End Semester Examination

**Time: 3 hours**

**Marks: 80**

#### Section A

**Marks: 15**

5 short answer compulsory questions of 3 marks each representing all unit/syllabi i.e., at least one question from each unit having 70-80 words answer.

#### Section B

**Marks: 35**

5 medium answer compulsory questions of 7 marks each, at least one question set from each unit having 250-300 words answer.

#### Section C

**Marks: 30**

2 long answer type questions of 15 marks each to be attempted from 5 given questions set from all units of the syllabus having 500-600 words answer.

**Syllabus for B.A. /B.Sc. Statistics (Semester V) Under CBCS  
GCW Parade College Jammu  
(Generic)**

**Title:** Statistical Computing-XI

**Course Code:** USTPGE-501

**Credits:** 02

**Total Marks:** 50

**Minor Test:** 25 Marks

**Major Test:** 25 Marks

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. There shall be computing exercises covering the applications of Statistics based on the entire syllabus of course no.USTTGE-501.

**List of Practical:** Practicals based on

1. Graphical representation of data.
2. Measures of central tendency.
3. Measures of dispersion.
4. Skewness and kurtosis.
5. Fitting of polynomials, exponential curves.
6. Correlation.
7. Partial and multiple correlations.
8. Regression.
9. ANOVA.

**Evaluation/Examination Pattern**

Assessment in Practical on the basis of day to day performance in the Laboratory:	12 Marks
Practical Internal Assessment Test:	08 Marks
Attendance:	05 Marks
(75% to 80% = 02 marks, 80% to 85% = 03 marks, 85% to 90% = 04 marks, above 90% = 05 marks)	
Practical External Assessment:	20 Marks
Viva-Voce Examination:	05 Marks

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Discipline Specific)**

**Title:** Vital Statistics and Statistical Techniques for  
Quality Control

**Course Code:** USTDSE-601

**Credits:** 04

**Total Marks:** 100

**Internal Examination:** 20 Marks

**External Examination:** 80 Marks

**Objectives:** The main objectives of this course are to provide the knowledge to the students about Statistical Quality Control and Vital Statistics (Measure of Mortality & Fertility, Life Table)

**Unit- I**

Introduction and sources of collecting data on vital statistics, errors in census and registration data. Measurement of population, rate and ratio of vital events. Measurements of Mortality: Crude Death Rate (CDR), Specific Death Rate (SDR), Infant Mortality Rate (IMR) and Standardized Death Rates. Stationary and Stable population,

**Unit-II**

Life (Mortality) Tables: Assumption, description, construction of Life Tables and Uses of Life Tables. Measurements of Fertility: Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (SFR) and Total Fertility Rate (TFR). Measurement of Population Growth: Crude rates of natural increase, Pearl's Vital Index, Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR).

**Unit-III**

Statistical Quality Control: Introduction, Basis and Benefits. Process Control and Product Control. Control Limits, Specification Limits and Tolerance Limits. 3-sigma limits and Concept of 6 sigma Limits. Chance and assignable causes of quality variation.

**Unit-IV**

Statistical Control Charts- Construction and Statistical basis of 3- $\sigma$  Control charts, analysis of patterns on control chart, Control charts for variables: X-bar & R-chart, X-bar & s-chart. Control charts for attributes: np-chart, p-chart, c-chart. Comparison between control charts for variables and control charts for attribute

**Unit-V**

Acceptance sampling plan: Principle of acceptance sampling plans. producers and consumer risks, Single and double sampling plan: their OC, AQL, LTPD, AOQL, ASN, ATI functions with graphical interpretation, Rectifying inspection plan.

**Books Recommended:**

1. P. Mukhopadhyay (1999): Applied Statistics, Books and Allied (P) Ltd.
2. A.M. Goon, M.K. Gupta and B. Dasgupta (2008): Fundamentals of Statistics, Vol. II, 9th Edition, World Press.
3. S. Biswas (1988): Stochastic Processes in Demography & Application, Wiley Eastern Ltd.
4. Fredrick E. Croxton, Dudley J.Cowden, and S. Klein (1973): Applied General Statistics, 3rd Edition. Prentice Hall of India Pvt. Ltd.
5. N. Keyfitz and John A. Beckman ( ): Demogrphy through Problems S-Verlag New york.
6. Montogomery, D. C. (2009): Introduction to Statistical Quality Control, 6th Edition, Wiley India Pvt. Ltd.



7. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
8. Mukhopadhyay, P (2011): Applied Statistics, 2nd edition revised reprint, Books and Allied(P) Ltd.
9. Montgomery, D. C. and Runger, G.C. (2008): Applied Statistics and Probability for Engineers, 3rd Edition reprint, Wiley India Pvt. Ltd.
10. McGraw Hill, Grant E.L (1964). Statistical Quality Control, McGraw Hill.
11. Duncan A.J (1974). Quality Control and Industrial Statistics, Taraporewala and Sons.

#### Scheme of Examination

Theory	Syllabus to be covered in the examination	Time Allotted	% Weight age (Marks)
Internal Assessment Test	Up to 40% (after 45 days)	1 hour	15% (15 marks) + 5% (5 marks of attendance)
External End Semester Exam	Up to 100% (after 90 days)	3 hour	80
Total			100

#### Evaluation/Examination Pattern

##### **Internal Assessment Test**

**Time: - 1 Hour**

**Marks: 15**

##### **Section A**

**5 Marks**

5 very short answer type question of 1 mark each covering 40% of the syllabus, set across all units (at least 2) covered.

##### **Section B**

**10 Marks**

2 long answer type question of 5 marks each to be attempted with internal choice, set from each unit.

##### **External End Semester Examination**

**Time: 3 hours**

**Marks: 80**

##### **Section A**

**Marks: 15**

5 short answer compulsory questions of 3 marks each representing all unit/syllabi i.e., at least one question from each unit having 70-80 words answer.

##### **Section B**

**Marks: 35**

5 medium answer compulsory questions of 7 marks each, at least one question set from each unit having 250-300 words answer.

##### **Section C**

**Marks: 30**

2 long answer type questions of 15 marks each to be attempted from 5 given questions set from all units of the syllabus having 500-600 words answer.

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Discipline Specific)**

**Title:** Statistical Computing-XII  
**Course Code:** USTDSP-601

**Total Marks:** 50  
**Minor Test:** 25 Marks  
**Major Test:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. There shall be computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTDSE-601.

**List of Practical:** Practicals based on

1. Demography.
2. Various types of Control Charts.
3. Life Tables.
4. Sampling Plans.

**Evaluation/Examination Pattern**

Assessment in Practical on the basis of day to day performance in the Laboratory:	12 Marks
Practical Internal Assessment Test:	08 Marks
Attendance:	05 Marks
(75% to 80% = 02 marks, 80% to 85% = 03 marks, 85% to 90% = 04 marks, Above 90% = 05 marks)	
Practical External Assessment:	20 Marks
Viva-Voce Examination:	05 Marks

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Operation Research (Theory and Applications)  
**Course Code:** USTTS- 601

**Total Marks:** 50  
**Internal Examination:** 10 Marks  
**External Examination:** 40 Marks

**Credits:** 02

**Objectives:-** After studying operation Research students should be able to understand the need of using OR as Quantitative approach for effective decision making.

**Unit-I**

- a) Operations Research (OR): Introduction to Operations Research, Its development, Characteristics and Scope, Importance of Operations Research in industry, Limitations of OR.
- b) Linear programming : Introduction to linear programming (LPP), Concepts of Convex set, Basic Solutions, Feasible Solutions, Basis Feasible Solutions, Optimum Solution and slack & surplus variables in linear programming problems (LPP).
- c) Mathematical formulation of LPP, Standard form of LPP, Graphical method of solving LPP (up to 2 variables) .
- d) Simplex Method, Computational details of simplex algorithm and summary.

**Unit-II**

- a) Artificial variable techniques (Two-phase technique) for solving a general LPP.
- b) Transportation Problem: Mathematical formulation and tabular representation. Concept of feasible. Basic feasible and optimal solutions with reference to T.P Methods for finding initial basic feasible solution
- c) North-West Corner Rule, Lowest Cost Entry, Vogel's Approximation method.
- d) Assignment Problem: Introduction Mathematical Models of Assignment Problem. Hungarian Method for solving assignment.

**Books Recommended:**

1. Gass S.I (1975): Linear Programming Methods and Applications, McGraw Hill.
2. S.D. Sharma (1994): Operations Research, Kedar Nath Ram Nath & Co, Meerut.
3. P.K. Gupta and D.S. Hira (2009) : Operations Research, S. Chand New Delhi.
4. J.K Sharma (2010): Operations Research (Theory & Applications). MacMillan Publishers India Ltd.
5. Philip M. Morse: Methods of Operations Research. Kormendi Press. Nagel Stuart S.
6. Nagel Stuart S.: Operations Research Methods. SAGE Publications Inc.
7. Pradeep Prabhakar Pai: Operations Research: Principles and Practice. Oxford University Press India.
8. Man Mohan, P.K. Gupta, Kanti Swarup: Introduction to Management Science Operations Research. Sultan Chand.

## **Scheme of Examination**

### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A,B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each. 2 questions shall be set from each unit of the prescribed course content. All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each. 1.5 questions shall be set from each unit of the prescribed course content. Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing-XIV  
**Course Code:** USTPS- 601

**Total Marks:** 50  
**Internal Examination:** 25 Marks  
**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-601.

**List of Practical:** Practical based on

- 1) Graphical method of LPP.
- 2) Simplex Method.
- 3) Artificial Variable Techniques.
- 4) North West Corner Rule.
- 5) Lowest Cost Entry Method.
- 6) Vogel's Approximation Method.
- 7) Hungarian Method.

**Evaluation Strategy**

**Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses. 5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

**External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Generic)**

**Title:** INTRODUCTORY PROBABILITY

**Course Code:** USTTGE- 601

**Total Marks:** 100

**Internal Examination:** 20 Marks

**External Examination:** 80 Marks

**Credits:** 04 (60 Contact Hours)

**Objectives:** The main aim of this course is to acquaint Students to Probability and Probability Distributions, Hypothesis, Test and Significance and Two Way ANOVA.

**Unit- I**

Probability: Introduction, random experiments, sample space, events and algebra of events. Definitions of Probability – classical, statistical, and axiomatic. Conditional Probability, laws of addition and multiplication, independent events, theorem of total probability, Bayes' theorem and its applications.

**Unit- II**

Random Variables: Discrete and continuous random variables, p.m.f., p.d.f., c.d.f. Illustrations of random variables and its properties. Expectation, variance, moments and moment generating function.

**Unit-III**

Binomial distribution: Definition, mean, variance and mgf, Physical Conditions and their properties with simple illustrations. Poisson distribution: Definition, mean, variance and mgf, Physical Conditions and their properties with simple illustrations. Normal distribution: Definition, mean, variance and mgf, their properties with simple illustrations.

**Unit-IV**

Null and alternative hypotheses, simple and composite hypotheses, level of significance and probabilities of Type I and Type II errors, power of a test and critical region. Sampling distribution of a statistic, sampling distribution of sample mean, standard error of sample mean. Large sample tests for single mean, difference of means, standard deviation and difference of standard deviations. Tests of Significance based on Chi-square (goodness of fit and independence of attributes), t distribution and F- distribution.

**Unit-V**

Concept of ANOVA for Two-Way Classification. Concept and Analysis of RBD, Advantages and Disadvantages of RBD. Concept and Analysis of LSD, Advantages and Disadvantages of LSD.

**Books Recommended:**

1. Hogg, R.V., Tanis, E.A. and Rao J.M. (2009): Probability and Statistical Inference, Seventh Ed, Pearson Education, New Delhi.
2. Miller, Irwin and Miller, Marylees (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Pearson Education, Asia.
3. Myer, P.L. (1970): Introductory Probability and Statistical Applications, Oxford & IBH Publishing, New Delhi
4. A.M. Goon, M.K. Gupta and B. Dasgupta (2003): An outline of Statistical Theory (Vol. I), 4th Ed., World Press, Kolkata.
5. S.C. Gupta and V.K. Kapoor (2007): Fundamentals of Mathematical Statistics, 11th Ed., Sultan Chand and Sons.

6. R.V. Hogg, A.T. Craig, and J.W. Mckean (2005): Introduction to Mathematical Statistics, 6th Ed. Pearson Education.

7. A.M. Mood, F.A. Graybill and D.C. Boes (2007): Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw Hill Publication.

8. V.K. Rohtagi and A.K. Md. E. Saleh (2009): An Introduction to Probability and Statistics, 2nd Edition, John Wiley and Sons.

9. S.A. Ross (2007): Introduction to Probability Models, 9th Ed., Academic Press.

#### Scheme of Examination

Theory	Syllabus to be covered in the examination	Time Allotted	% Weight age (Marks)
Internal Assessment Test	Up to 40% (after 45 days)	1 hour	15% (15 marks) + 5% (5 marks of attendance)
External End Semester Exam	Up to 100% (after 90 days)	3 hour	80
Total			100

#### Evaluation/Examination Pattern

##### Internal Assessment Test

**Time: - 1 Hour**

**Marks: 15**

##### Section A

**5 Marks**

5 very short answer type question of 1 mark each covering 40% of the syllabus, set across all units (at least 2) covered.

##### Section B

**10 Marks**

2 long answer type question of 5 marks each to be attempted with internal choice, set from each unit.

##### External End Semester Examination

**Time: 3 hours**

**Marks: 80**

##### Section A

**Marks: 15**

5 short answer compulsory questions of 3 marks each representing all unit/syllabi i.e., at least one question from each unit having 70-80 words answer.

##### Section B

**Marks: 35**

5 medium answer compulsory questions of 7 marks each, at least one question set from each unit having 250-300 words answer.

##### Section C

**Marks: 30**

2 long answer type questions of 15 marks each to be attempted from 5 given questions set from all units of the syllabus having 500-600 words answer.

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Generic)**

**Title:** Statistical Computing-XIII  
**Course Code:** USTPGE- 601

**Total Marks:** 50  
**Minor Test:** 25 Marks  
**Major Test:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. There shall be computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTGE-601.

**List of Practical:** Practicals based on

1. Fitting of Binomial Distribution.
2. Fitting of Poisson Distribution.
3. Fitting of Normal Distribution
4. t-test.
5. Chi-Square test.
6. F-test.
7. Area Property Of Normal Distribution.
8. Two –Way ANOVA.
9. RBD.
10. LSD.

**Evaluation/Examination Pattern**

Assessment in Practical on the basis of day to day performance in the Laboratory:	12 Marks
Practical Internal Assessment Test:	08 Marks
Attendance:	05 Marks
(75% to 80% = 02 marks, 80% to 85% = 03 marks, 85% to 90% = 04 marks, Above 90% = 05 marks)	
Practical External Assessment:	20 Marks
Viva-Voce Examination:	05 Marks



**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Computing Skills Using SPSS

**Course Code:** USTTS-602

**Total Marks:** 50

**Internal Examination:** 10 Marks

**External Examination:** 40 Marks

**Credits:** 02

**Objectives:** The main focus of the course will be on to solve their research question using SPSS software. As you know that, students are facing problem specially who are pursuing research in their subject that how to manage and analyze the data after collection of survey questionnaire. Course will be focus on how to analyze survey questionnaire using SPSS software. Also students should make aware to chose appropriate statistical technique and interpret results.

**Unit-I**

- a) Type of Scale of Measurements, Choosing appropriate scale and measurement to the data, Preparing codebook. Getting to Know SPSS: Starting SPSS, Working with data file, SPSS windows, Menus, Dialogue boxes. Preparing the Data file: Creating data file and entering data, Defining the variables, entering data, modifying data file, import file.
- b) Screening and cleaning data, Manipulation of data. Tabulation of Data: Introduction Frequency Tables, Cross Tabulation Basic & General Tables, Multi Response Tables.
- c) Graphs: Bar Diagram, Stem and Leaf Plot, Histogram, PP plots, QQ Plots, Box-Whisker Plot, Error Diagram, Pie Chart.
- d) Descriptive Statistics: Categorical variables, continuous variables, checking normality, outliers checking. Choosing the right statistics: Overview of different statistical techniques, Decision making process.

**Unit-II**

- a) Concepts of p-value, level of significance, one sided and two sided tests , confidence interval ,Standard Error of mean.
- b) Correlation: Pearson product moment correlation, Spearman rank correlation, Partial correlation. Simple linear regression, Multiple Linear Regression: Assumptions, overall significance.
- c) One sample and two independent sample t-test, Paired sample t-test, One way Analysis of variance, Two ways ANOVA, Analysis of Covariance, Repeated measures.
- d) Independent Chi square Test, Mann- Whitney test, Wilcoxon signed rank test, Kruskal- Wallis test.

**Books Recommended:**

1. Discovering Statistics Using IBM SPSS Statistics by Andy Field
2. SPSS For Introductory and Intermediate Statistics: IBM SPSS For Intermediate Statistics by Nancy L Leech
3. Data Analysis With IBM SPSS Statistics: Implementing Data Modeling, Descriptive Statistics And ANOVA by Kenneth Stehlik-Barry and Anthony J. Babinec
4. IBM SPSS by Example by Alan C. Elliott; Wayne A. Woodward

5. How to Use SPSS by Brian C Cronk
6. Adventures in Social Research: Data Analysis Using IBM SPSS Statistics by Earl R Babbie and Willian E Wagner
7. IBM SPSS: Comprehensive Beginners Guide To Learn Statistics Using IBM SPSS From A-Z by Walker Schmidt

### **Scheme of Examination**

#### **Internal Assessment**

Internal Assessment (10 Marks) shall be based on Unit-I as per the adopted procedure for other courses. No marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

#### **External End Semester Examination**

Maximum Marks = 40

Question paper shall have three (A,B and C) sections:-

**Section A** shall comprise of 4 questions of 2 marks each.2 questions shall be set from each unit of the prescribed course content. All questions shall be compulsory.

**Section B** shall comprise of 4 questions of 5 marks each.2 questions shall be set from each unit of the prescribed course content.All questions are compulsory.

**Section C** shall comprise of 3 questions of 12 marks each.1.5 questions shall be set from each unit of the prescribed course content.Students shall be asked to attempt only one question of 12 marks from this section.

**Syllabus for B.A. /B.Sc. Statistics (Semester VI) Under CBCS  
GCW Parade College Jammu  
(Skill Enhancement)**

**Title:** Statistical Computing Using SPSS-XV

**Course Code:** USTPS- 602

**Total Marks:** 50

**Internal Examination:** 25 Marks

**External Examination:** 25 Marks

**Credits:** 02

**Objectives:** The Objectives of the course is to expose the students to the real life applications of statistical tools. The computing exercises covering the applications of Statistics based on the entire syllabus of course no. USTTS-602.

**List of Practical:** Practicals based on

1. Introduction to SPSS, Data entry, Data Screening, Data Cleaning.
2. Draw histogram, Stem and Leaf plot, Box plot frequency polygon, pie chart, bar graphs, line charts, PP plot, QQ plot, Scatter diagram.
3. Measures of Central tendency
4. Measures of Dispersion.
5. Testing for Normality.
6. Correlation Coefficient.
7. Linear Regression
8. Tests based on Chi-Square Distribution- t-Distribution and F- Distribution.
9. One Way ANOVA and Two Way ANOVA.
10. Non-Parametric tests. .

### **Evaluation Strategy**

#### **Internal Assessment**

Internal Assessment (25 Marks) as per adopted procedure for other courses.5 marks have been earmarked for attendance, however the eligibility criterion for appearing in the end semester examination shall remain the same as is followed in other courses.

#### **External End Semester Examination**

Maximum Marks = 25. Procedure of the External examination shall remain the same as is followed in other Practical courses.