

**STATISTICS: COMPLEMENTARY Syllabus for B.Sc.**

**CBCSSUG 2019 (2019 admission onwards)**

**SYLLABUS FOR B.Sc. (PSYCHOLOGY MAIN)**

Sem No	Course Code	Course Title	Instructional Hours/week	Credit	Exam Hours	Ratio Ext: Int
1	STA 1C 02	<b>DESCRIPTIVE STATISTICS</b>	4	3	2	4:1
2	STA 2C 02	<b>REGRESSION ANALYSIS AND PROBABILITY THEORY</b>	4	3	2	4:1
3	STA 3C 02	<b>PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS</b>	5	3	2	4:1
4	STA 4C 02	<b>STATISTICAL TECHNIQUES FOR PSYCHOLOGY</b>	5	3	2	4:1

## SEMESTER I

### STA 1C 02- DESCRIPTIVE STATISTICS

Contract Hours per week: 4

Number of credits: 3

Number of Contact Hours: 72

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

#### Question Paper Pattern

Type of Questions	Question number (From..... To .....)	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions <b>(Maximum Marks 20)</b>
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions <b>(Maximum Marks 30)</b>
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) <b>(Maximum Marks 10)</b>
<b>Total</b>	<b>01 to 21</b>	<b>60</b>

**Question Paper setter has to give equal importance to both theory and problems in sections B and C.**

#### Objectives

1. To generate interest in Statistics
2. To equip the students with the concepts of basic Statistics
3. To provide basic knowledge about Statistical methods

**Module 1:** *A basic idea about data-* collection of data, primary and secondary data, organization, planning of survey and diagrammatic representation of data

**10 Hours**

**Module 2:** *Classification and tabulation-* Classification of data, frequency distribution, formation of a frequency distribution, Graphic representation *viz.* Histogram, Frequency Curve, Polygon, Ogives, Bar diagram and Pie diagram

**10 Hours**

**Module 3:** *Measure of central tendency-* Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, Combined Mean, Advantages and disadvantages of each average

**20 Hours**

**Module 4:** *Measures of dispersion-* Range, Quartile Deviation, Mean Deviation, Standard Deviation, Combined Standard Deviation, Percentiles, Deciles, Relative Measures of Dispersion, Coefficient of variation

**16 Hours**

**Module 5: Skewness and Kurtosis-** Pearson's and Bowley's coefficient of skewness, Percentile Measure of Kurtosis

**16 Hours**

### References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.
5. Mukhopadhyay, P. *Mathematical Statistics*. New central Book Agency (P) Ltd: Calcutta.

### Assignments/ Seminar

Assignments/Seminar are to be given to students. The purpose of the assignments/seminar is to provide practical exposure to the students.

## SEMESTER II

### STA 2C 02- REGRESSION ANALYSIS AND PROBABILITY THEORY

Contract Hours per week: 4

Number of credits: 3

Number of Contact Hours: 72

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

### Question Paper Pattern

Type of Questions	Question number (From..... To .....)	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
<b>Total</b>	<b>01 to 21</b>	<b>60</b>

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

### Objectives

1. To make the students aware of various Statistical tools

2. To create awareness about probability

**Module 1:** *Bivariate data*- relationship of variables, correlation analysis, methods of studying correlation, Scatter Diagram, Karl Pearson's Coefficient of Correlation, Calculation of Correlation from a 2-way table, Interpretation of Correlation Coefficient, Rank Correlation

**11 Hours**

**Module 2:** *Regression analysis*- linear regression, Regression Equation, Identifying the Regression Lines properties of regression coefficients, numerical problems

**9 Hours**

**Module 3:** *Partial and Multiple Correlation Coefficients*- Multiple Regression Equation, Interpretation of Multiple Regression Coefficients (three variable cases only)

**16 Hours**

**Module 4:** *Basic probability*- Sets, Union, Intersection, Complement of Sets, Sample Space, Events, Classical, Frequency and Axiomatic Approaches to Probability, Addition and Multiplication Theorems, Independence of Events (Up-to three events)

**20 Hours**

**Module 5:** *Random Variables and their probability distributions*- Discrete and Continuous Random Variables, Probability Mass Function, Distribution Function of a Discrete Random Variable

**16 Hours**

## References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.
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## SEMESTER III

### STA 3C 02- PROBABILITY DISTRIBUTIONS AND PARAMETRIC TESTS

Contract Hours per week: 5

Number of credits: 3

Number of Contact Hours: 90

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

## Question Paper Pattern

Type of Questions	Question number (From..... To .....)	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
<b>Total</b>	<b>01 to 21</b>	<b>60</b>

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

### Objectives

1. To get a general understanding on various probability distributions
2. To familiarize the uses of Statistical test.

**Module 1:** *Distribution Theory*- Binomial, Poisson and Normal Distributions, Mean and Variance (without derivations), Numerical Problems, Fitting, Importance of Normal Distribution, standard normal distribution, simple problems using standard normal tables, Central Limit Theorem (Concepts only)

**25 Hours**

**Module2:** *Methods of Sampling*- Random Sampling, Simple Random Sampling, Stratified, Systematic and Cluster Sampling, Non Random sampling, Subjective sampling, Judgment sampling and convenience sampling

**20 Hours**

**Module 3:** *Fundamentals of Testing*- Type-I & Type-II Errors, Critical Region, Level of Significance, Power,  $p$  value, Tests of Significance

**15 Hours**

**Module 4:** *Large Sample Tests* – Test of a Single, Mean Equality of Two Means, Test of a Single Proportion, and Equality of Two Proportions

**10 Hours**

**Module 5:** *Small Sample tests*-Test of a Single Mean, Paired and Unpaired t-Test, Chi-Square Test of Variance, F-Test for the Equality of Variance, Tests of Correlation

**20 Hours**

### References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.

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## SEMESTER IV

### STA 4C 02- STATISTICAL TECHNIQUES FOR PSYCHOLOGY

Contract Hours per week: 5

Number of credits: 3

Number of Contact Hours: 90

Course Evaluation: External 60 Marks+ Internal 15 Marks

Duration of Exam: 2 Hours

### Question Paper Pattern

Type of Questions	Question number (From..... To .....)	Marks
Short Answer	01 to 12	Short answer type carries 2 marks each - 12 questions (Maximum Marks 20)
Paragraph/ Problems	13 to 19	Paragraph/ Problem type carries 5 marks each – 7 questions (Maximum Marks 30)
Essay	20 to 21	Essay type carries 10 marks (1 out of 2) (Maximum Marks 10)
<b>Total</b>	<b>01 to 21</b>	<b>60</b>

Question Paper setter has to give equal importance to both theory and problems in sections B and C.

### Objectives

1. To make the students aware of various Statistical test in different areas of Psychology
2. To give knowledge about applications of Statistics in different areas of Psychological studies.

**Module 1:** *Analysis of Variance*- assumptions, One-way and Two-way Classification with Single Observation per Cell, Critical Difference

**20 Hours**

**Module 2:** *Non Parametric tests*- Chi-square Test of Goodness of Fit, Test of Independence of Attributes, Test of Homogeneity of Proportions

**20 Hours**

**Module 3:** *Sign Test*- Wilcoxon's Signed Rank Test, Wilcoxon's Rank Sum Test, Run Test and Krushkal-Wallis Test

**20 Hours**

**Module 4:** *Factorial Design*- Basics of factorial Design, Factorial experiments and their uses in Psychological studies, Concepts of  $2^2$ ,  $2^3$  factorial experiments (without derivation), simple problems

**15 Hours**

**Module 5:** *Preparation of Questionnaire*- Scores and Scales of Measurement, Reliability and Validity of Test Scores

**15 Hours**

## References

1. Gupta, S.P. *Statistical Methods*. Sultan Chand and Sons: New Delhi.
2. Gupta, S.C., & Kapoor, V.K. *Fundamentals of Applied Statistics*. New Delhi: Sultan Chand and Sons.
3. Garret, H.E., & Woodworth, R.S. *Statistics in Psychology and Education*. Bombay: Vakila, Feffex and Simens Ltd.
4. Mood, A.M., Graybill, F.A and Boes, D.C. *Introduction to Theory of Statistics*. 3rd Edition Paperback – International Edition.
5. Douglas C. Montgomery. *Design and Analysis of Experiments*. 9th Edition.

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