

SK Womens's College  
Department of Statistics

For Bsc/B.A Programmes

Physics, Mathematics, Statistics  
Economics, Mathematics, Statistics.

## **UG-STATISTICS**

### **Choice based credit system**

#### **Programme outcome for Bachelor of Science in Physics, Mathematics, Statistics.**

After completing the graduation in the Bachelor of Science the students are able to:

PO1: Demonstrate proficiency in statistics and the statistical concepts needed for a proper understanding of Mathematics.

PO2: Recognize and appreciate the connections between theory and applications.

PO3: Apply the scientific method to design, execute and analyze an experiment.

PO4: Be familiar with a variety of examples where Mathematics and statistics helps accurately explain the phenomena.

PO5: Appreciate the role of physics in the society.

PO6. Apply statistical analysis in aspects of every field.

PO7. Be able to read mathematical and statistical literature of various types including survey articles, scholarly books and online sources.

PO8. Apply mathematical ideas and models to those problems.

PO9. Ability to compute Eigen values and Eigen vectors.

PO10. Derive numerical method of various mathematical operations and tasks, such as interpolation, differentiation, integration.

#### **Programme specific outcome for B.Sc. in Physics, Mathematics, Statistics.**

After completing the graduation in Physics the students are able to:

PSO1. Develop competence to write competitive examinations.

PSO2. Find career opportunities.

PSO3. Develop proficiency in the analysis of complex physical problems.

PSO4. Understand basic theoretical and applied principles of statistics needed to enter the job force.

PSO5. Communicate key statistical concepts to non-statisticians.

PSO6. Mathematical or other appropriate techniques to solve problems.

PSO7. Demonstrate skills in the use of computers.

## **UG-STATISTICS – CBSC Scheme**

### **Programme outcome for Bachelor of Science/Arts in Mathematics, Statistics, Economics.**

After completing the graduation in the Bachelor of Science/Arts the students are able to:

- Po1: Equip the student with skill to analyze problems, formulate the hypothesis.
- Po2: Prepare students for perusing research or carriers in mathematical sciences and allied field.
- Po3: Create awareness to become on enlightened citizen with commitment to deliver one's responsibilities with the scope of bestowed rights and privileges.
- Po4: Developing research knowledge in statistics and Economics.
- Po5: Developing the skill data collection and use of sampling techniques in research.
- Po6: Understanding the efficiency and equity implications of market interference, including government policy.
- Po7: General equilibrium, economic efficiency and market failure.
- Po8: Use of differential and difference equations in Economics.
- Po9: To deal with the advance theoretical issues and their practical applications of distribution theories.

### **Programme specific outcome for B.Sc./B.A in Mathematics, Statistics, Economics.**

After completing the graduation in Physics the students are able to:

- PSo1. Develop competence to write competitive examinations.
- PSo2. Find career opportunities.
- PSo3. Develop proficiency in the analysis of complex physical problems.
- PSo4. Understand basic theoretical and applied principles of statistics needed to enter the job force.
- PSo5. Communicate key statistical concepts to non-statisticians.
- PSo6. Mathematical or other appropriate techniques to solve problems.
- PSo7. Demonstrate skills in the use of computers.

## **Programme Specific outcome of statistics.**

**The students at the end of the B.A or Bsc statistics programme can become a**

<b>PS01</b>	<b>Bank Manager</b>
<b>PS02</b>	<b>Business Manager</b>
<b>PS03</b>	<b>Administrator</b>
<b>PS04</b>	<b>Statistician</b>
<b>PS05</b>	<b>Content Analyst</b>
<b>PS06</b>	<b>Statistic Trainer</b>
<b>PS07</b>	<b>Data Scientist</b>
<b>PS08</b>	<b>Consultant</b>
<b>PS09</b>	<b>Biostatistician</b>

SEMESTER I

COURSE CODE: 101

CREDITS: THEORY- 06, PRACTICAL-01

THEORIES-90 LECTURES

COURSE OUTCOME:

After successful completion of the course, the student is able to

- C01. Ability to design data collection plans and basic tools of descriptive statistics.
- C02. Analyze statistical data graphically.
- C03. Analyzes statistical data using measures of central tendency, dispersion and location.
- C04. Learn in details about moments.
- C05. Deliberate the details of skewness and kurtosis.
- C06. Calculate probabilities using conditional probability rule of Boole's inequality and Baye's Theorem.
- C07. Learn in depth applications of addition and multiplication theorems.

## SEMESTER II

COURSE CODE: 202

CREDITS: THEORY- 06, PRACTICAL-01

THEORIES-90 LECTURES

On successful completion of this course, the students are able to:

- C01: Understand the random number and its different types.
- C02: Ability to distinguish between random and non-random experiments.
- C03: knowledge related to concept of discrete and continuous random variables and their probability distributions including moments.
- C04: Learn in details of correlation, regression analysis and curve fitting.
- C05: Calculate and interpret the correlation between two variables.
- C06: To develop the mathematical skills of the students in the areas of numerical methods.
- C07: Apply various interpolation methods and finite different concepts.
- C08: Work numerically on the ordinary differential equations using different methods through the different methods through the theory of finite differences.

SEMESTER III

COURSE CODE: 303

CREDITS: THEORY- 06, PRACTICAL-01

THEORIES-90 LECTURES

Students will acquire

- C01: Understand the important of various discrete and continuous distributions.
- C02: Keen knowledge about the difference between census and sample survey.
- C03: Basic knowledge of complete enumeration, sample and sampling techniques.
- C04: Use techniques of selecting a random sample.
- C05: Discuss the consistency of data as well as its condition for consistency.
- C06: Analyze the concepts of independence and its association of two attributes.
- C07: Demonstration of Demography.
- C08: Construction and implication of complete life table.
- C09: Learn the measurement of mortality rates, fertility rates and reproduction rate.
- C10: Fitting of logistic curve, derivation and by using Pearl and Reed method and its use in population projection.

SEMESTER IV

COURSE CODE: 404

CREDITS: THEORY- 06, PRACTICAL-01

THEORIES-90 LECTURES

On successful completion of this course the students can:

- C01: Learn the different kinds of sampling distribution.
- C02: Be able to know the different kinds of hypothesis and level of significance.
- C03: Understand the type of I and II errors.
- C04: Calculate a p-value, size of a test power and power function of a test.
- C05: Specify the large sample test.
- C06: Understand the time series data and its applications.
- C07: Fitting of trend by graphical, semi-averages, principle of least square and moving averages method.
- C08: Identify situations where one-way ANOVA is appropriate and the degrees of freedom associated with each sum of squares and lastly interpret an ANNOVA table.
- C09: Learn the different kinds of design of experiments.
- C010: Understand the primary purposes of an index number.
- C011: To discuss the different kinds of index numbers.
- C012: Learn the construction of wholesale and cost of living index number.



SEMESTER V (A)

COURSE CODE: STA: H:01

CREDITS: THEORY- 05, PRACTICAL-01

THEORIES-100 LECTURES

After successful completion of the course, the student is able to

- C01: Learn about sets, type of sets and its elementary properties, field and a-field, measurement functions and measure space.
- C02: Understand basic things of sequences like convergence and testing if convergence by using different criteria as comparison, Cauchy and Raabe's etc.
- C03: Learn about determinant and Matrices and their properties and different types of matrices.
- C04: Learn about computer and its generation, uses types of computer, integral parts, how to calculate in M.S. Excel sheet.
- C05: Learn how statement functions, subroutines and other function work.

SEMESTER V (B)

COURSE CODE: STA: H: 502

CREDITS: THEORY- 05,

Approximately Lectures 100.

After completion of the course, the student will be able to:

- C01: Learn Normal distribution as a limiting case of binomial distribution, joint prob. Mass and density functions, joint, marginal and conditional distributions.
- C02: Learn Minimum variance estimator, calculate and interpret confidence intervals for maximum likelihood parameter estimates.
- C03: Learn the procedure for planning experiments so that the data obtained can be analyzed to yield valid and objective conclusions and also selecting the process factors for the study.
- C04: Learn calculate and interpret the correlation between two variables, determine whether the correlation is significant, the process of constructing a mathematical function.
- C05: Explain about the calculating the sample variance and unbiased estimator, how is that related to this topic of sample proportion.

## SEMESTER V I

COURSE CODE: 608

CREDITS: THEORY- 05, THEORIES-100 LECTURES

After completion of this course the students will be able to:

- C01: Explain in detail the motion of parametric model and point estimation
- C02: Demonstrate the plausibility of pre-specified ideas about the parameters of the model by examining the area of hypothesis testing.
- C03: Explain in detail and demonstrate the use of non-parametric statistical methods.
- C04: Discuss the role of quality control in production and service operations.
- C05: Apply the tools of 3-sigma control limits
- C06: Learn the process control, product control and operation about sampling plan.
- C07: Explain the objectives of seasonal variation and cyclic movements.
- C08: Fitting of spencer's 15 point and 21-point formulae.

## SEMESTER-VI

COURSE CODE: STA: 609

CREDITS: THEORY- 05, PRACTICAL-01

THEORIES: Approximately 100 LECTURES

After completion of the course, the student is able to:

- C01: Learns method of approximation, reversion of series method, Weddle's rule, central difference, Sterling's formulae etc.
- C02: Learns derivations of finite difference interpolation formulae such as Laplace-Everett, Newton's Cots, Euler-Maclaurin's Summation and Sterling's formula for factorial n
- C03: Formulate and solve problems as networks and graphs develop linear programming model of shortest path, maximum flow minimal spanning tree, critical path, minimum cost, flow and transshipment. Solve the problems using special solution algorithms.
- C04: Ability to evaluate and apply statistical measurement, Principles to their area of.
- C05: Have knowledge on the various objectives, failures and interferences, describe the concept of statistical averages.