

**SHIVRAJ COLLEGE OF ARTS, COMMERCE AND D. S. KADAM  
SCIENCE COLLEGE, GADHINGLAJ.  
DEPARTMENT OF STATISTICS  
B.Sc. (STATISTICS)**

- **Program Specific Outcomes (PSOs)**

After completion of B.Sc. Statistics program will be able to:

1. Be statistically and numerically literate.
2. Develop probability models for studying real life phenomenon in diverse disciplines.
3. Efficiently interpret and translate the outcomes obtained from analysis of probability models to an environment understandable to a layman.
4. Effectively use necessary statistical software and computing environment including R, MS-EXCEL among others
5. Apply statistical techniques to optimize and monitor real life phenomena related to industry and business analytics etc.
6. Be able to independently read statistical literature including survey articles, scholarly books, and online sources;

- **Course Outcomes**

### **B.Sc. I /Semester I**

- ❖ **STAT DSC – 7A Descriptive Statistics-I(Theory + Practical)**

- Knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
- Knowledge of various types of data, variables and attributes. Their organization and evaluation of summary measures such as measures of central tendency, measures of dispersion, skewness and kurtosis etc. and to interpret them.
- Insights into preliminary exploration of different types of data.
- Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes and to interpret the results.

- ❖ **STAT DSC-8A Elementary Probability Theory(Theory + Practical)**

- Ability to distinguish between random and non-random experiments.
- Knowledge to conceptualize the probabilities of events including frequent and axiomatic approach.
- Basic terminologies of probability.

- Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem
- Concept of independence of events.

## **B.Sc. I /Semester II**

### **❖ STAT DSC – 7B Descriptive Statistics-II(Theory + Practical)**

- To have knowledge of correlation, to compute correlation coefficient and interpret of its value.
- To acquire concept of regression analysis, to compute regression coefficient and to interpret its value.
- To study Meaning and utility of index numbers, to compute various index numbers.
- To acquire knowledge related to different type of test for index number.

### **❖ STAT DSC-8B Discrete Probability Distributions(Theory + Practical)**

- To apply discrete probability distributions studied in this course in different situations.
- Distinguish between discrete variables and study of their distributions.
- Knowledge related to concept of discrete random variables and their probability distributions including expectation and moments.
- Know some standard discrete probability distributions such as Bernoulli, Binomial and Hyper-geometric with real life situations.
- Understand concept of bivariate distributions and computation of related probabilities.

## **B.Sc. II /Semester III**

### **❖ STAT DSC-7C Probability Distributions-I (Theory + Practical)**

- Understand concept of discrete and continuous probability distributions with real life situations.
- Distinguish between discrete and continuous distributions.
- Find the various measures of random variable and probabilities using its probability distribution.
- Know the relations among the different distributions.
- Understand the concept of transformation of univariate and bivariate continuous random variable.

❖ **STAT DSC-8C Statistical Methods-I (Theory + Practical)**

- Understand the concept of Multiple Linear Regression.
- Understand the concept of Multiple Correlations and Partial Correlation.
- Know the concept of sampling theory.
- Understand the need of vital statistics and concept of mortality and fertility.

**B.Sc. II /Semester IV**

❖ **STAT DSC-7D Probability Distributions-II(Theory + Practical)**

- Know some standard continuous probability distributions with real life situations.
- Distinguish between various continuous distributions.
- Find the various measures of continuous random variable and probabilities using its probability distribution.
- Understand the relations among the different distributions.
- Understand the Chi-Square, t and F distributions with their applications and inter relations.

❖ **STAT DSC-8D Statistical Methods-II(Theory + Practical)**

- Know the concept and use of time series.
- Understand the meaning, purpose and use of Statistical Quality Control, construction and working of control charts for variables and attributes.
- Apply the small sample tests and large sample tests in various situations.

**B.Sc. III/Semester V**

❖ **STATISTICS – IX DSE-E13: Probability Distributions**

- Knowledge of important univariate distributions such as Laplace, Cauchy,
- Lognormal, Weibull, Logistic, Pareto, Power Series Distribution.
- Knowledge of Multinomial and Bivariate Normal Distribution.
- Knowledge of Truncated Distributions.
- Information of various measures of these probability distributions.
- Acumen to apply standard continuous probability distributions to different Situations.

❖ **SUBJECT – STATISTICS – X DSE-E14: Statistical Inference-I**

- Knowledge about important inferential aspect of point estimation.
- Concept of random sample from a distribution, sampling distribution of a statistic,
- standard error of important estimates such as mean and proportions.
- Knowledge of various important properties of estimator

- Knowledge about inference of parameters of standard discrete and continuous distributions.
- Concept of Fisher information and CR inequality.
- Knowledge of different methods of estimation.
- ❖ **SUBJECT – STATISTICS – XI DSE-E15: Design of Experiments**
  - Knowledge of basic terms used in design of experiments.
  - Concept of one-way and two-way analysis of variance.
  - Knowledge of various designs of experiments such as CRD, RBD, LSD and factorial experiments.
  - Knowledge of using an appropriate experimental design
- ❖ **SUBJECT – STATISTICS – XII DSE-E16: R-Programming and Quality Management**
  - Importance of R- programming
  - Knowledge of identifiers and operators used in R.
  - Knowledge of conditional statements and Loops used in R.
  - Knowledge of quality tools used in Quality management.
  - Knowledge of process and product control used in Quality management.

### **B.Sc. III /Semester VI**

- ❖ **SUBJECT – STATISTICS – XIII DSE-F13: Probability Theory and Applications**
  - Knowledge about order statistics and associated distributions.
  - Concept of convergence and Chebychevs inequality and its uses
  - Concept of law large numbers and central limit theorem and its uses.
  - Knowledge of terms involved in reliability theory as well as concepts and measures
- ❖ **SUBJECT – STATISTICS – XIV DSE-F14: Statistical Inference-II**
  - Concept of interval estimation.
  - Knowledge of interval estimation of mean, variance and population proportion.
  - Knowledge of important aspect of test of hypothesis and associated concept.
  - Concept about parametric and non-parametric methods.
  - Knowledge of some important parametric as well as non-parametric tests.

❖ **SUBJECT – STATISTICS – IX DSE-F15: Sampling Theory**

- Basic knowledge of complete enumeration and sample, sampling frame sampling distribution, sampling and non-sampling errors, principle steps in sample surveys, sample size determination, limitations of sampling etc.
- Concept of various sampling methods such as simple random sampling, stratified random sampling, systematic sampling and cluster sampling.
- An idea of conducting sample surveys and selecting appropriate sampling techniques.
- Knowledge of comparing various sampling techniques.
- Knowledge of ratio and regression estimators.

❖ **SUBJECT – STATISTICS – XVI DSE-F16: Operations Research**

- Concept of Linear programming problem.
- Knowledge of solving LPP by graphical and Simplex method
- Knowledge of Transportation, Assignment and Sequencing problems.
- Concept of queuing theory.
- Knowledge of simulation technique and Monte Carlo technique of simulation.

