

**Government of Karnataka ,Department of PU Education  
Statistics Course Book for First Year Pre University Course  
Syllabus**

Sl No	OBJECTIVES	UNIT	SUB-UNIT	No of HOURS	EVALUATION	ACTIVITIES
-	Recapitulation of basic knowledge of mathematics.	<b>Pre - requisites</b>	Laws of indices, Common logarithms and its applications, Solving simultaneous equations and Set theory.	8 Hours	Applications of logarithms and laws of indices-multiplication, division, finding power of a number.	Problems on logarithms and laws of indices-multiplication, division, finding power of a number.
1	*To know a short historical development of the subject of statistics. To discuss the two definitions of statistics. *To give an overview of statistics in various disciplines. *To understand the various functions and limitations of statistics.	<b>I Introduction to Statistics and some basic concepts.</b>	Meaning - Origin - Scope. Definitions -singular and plural sense. Characteristics, Branches, Functions and limitations. Statistical applications in other subjects. Distrust of Statistics - causes and remedies. Some basic concepts - units, population, sample, qualitative characteristic, quantitative characteristic, attribute, variables (discrete and continuous), nominal scale and ordinal scale.	7 Hours	Understand the origin, meaning and definitions of statistics. Students learn to differentiate qualitative and quantitative data. And also realise the importance of statistics in other fields. Also know how statistics can be misused.	State the definitions of statistics, functions and limitations. To give examples for ordinal and nominal scales.
2	*To enable the students, to know the stages and types of statistical enquiry, types and methods of collecting data.	<b>II Organization of data.</b>	Statistical enquiry and its stages. Primary and Secondary data. Methods of collection of primary data, with merits and demerits. Essentials of a good questionnaire. Questionnaire and schedule with respect to their relative merits and demerits. Sources of secondary data. Census Enumeration and Sample Survey with respect to their relative merits and demerits. Pilot survey. Sampling - Methods of sampling.	7 Hours	Students are able to identify the differences among the different types of data collection and also understand the sample survey and census enumeration with their advantages and disadvantages.	What are primary and secondary data? What are the methods of collection of primary data? Sources of secondary data.
3	*To enable the students as to how to arrange raw data in array and then construct frequency and cumulative frequency tables.	<b>III Classification and Tabulation</b>	Classification- ntroduction, Meaning and objectives. Types with examples. Frequency distributions- Discrete and Continuous variable, Rules of classification. Formation of univariate and bi-variate frequency distributions. Tabulation: Meaning, Parts of a table, Rules of tabulation, Types of tables and drafting of tables.	10 Hours	Students understand how to present the numerical data in a tabular form, and able to differentiate between discrete and continuous frequency distributions.	Preparation of univariate and Bivariate frequency tables. Drafting of tables with and without numerical data.
4	*To develop the skill among the students to draw diagrams and graphs. *To understand the relative merits and limitations of each types of diagram.	<b>IV Diagrammatic and Graphical representation of data:</b>	Diagrams- Meaning, needs, general rules of construction and types. Graphs-construction and types Comparison of tables and diagrams, difference between diagrams and graphs.	10 Hours	Drawing of a suitable diagram for a given data and to able to locate median, mode and partition values graphically.	To draw bar diagrams, pie-diagram, histogram, frequency polygon and ogives.
5	*To understand the requirement of an good average, measure of dispersion. *To make the students to understand the skewness and kurtosis with suitable diagrams.	<b>V Analysis of univariate data.</b>	Measures of central tendency - Meaning, objectives, types of averages-definitions, formulae and problems on ungrouped and grouped data. Measures of position- Meaning, definitions of quartiles, deciles and percentiles. Problem on ungrouped and grouped data. Measures of dispersion- Meaning and objectives. Types - absolute and relative measures and their definitions, formulae and problems on ungrouped and grouped data.	25 Hours	Students are able to select and compute the most appropriate average and measures of dispersion for a given data and interpret. They are able to differentiate between average and dispersion. Understanding and computation of the skewness of a given frequency distribution.	To compute various types of averages, measures of dispersion and skewness. To draw conclusions about the reliability, consistency and variability of different types of data.

			Moments -Meaning, definition of central moments, description of first four central moments. Formulae for $\beta_1, \gamma_1, \beta_2$ and $\gamma_2$ . Skewness- Definition, types with diagram, measures of skewness. Kurtosis- Definition, explanation of kurtosis with diagram, measure of kurtosis based on moments		Understanding the kurtosis of frequency distributions.	
6	(i) To illustrate the use correlation analysis and linear regression for Bivariate data (ii) To introduce the concept of rank correlation. (iii) To state the properties of regression and correlation techniques.	<b>VI Analysis of bivariate data.</b>	Correlation-types, methods of computation-graphical and numerical methods and properties. Regression-definition, regression equations, properties of regression lines and regression coefficients and related problems.	15 Hours	Students will be able to identify the relationship between two correlated variables. Distinguish between Karl Pearson's correlation coefficient and Spearman's rank correlation coefficient. To write down the regression equations for the given Bivariate data and estimate the values.	To draw scatter diagram for a given Bivariate data and compute correlation and rank correlation. To estimate the unknown value of a variable with the known value of the other.
7	The main purpose of study of this chapter to know and to measure the relation between two attributes.	<b>VII Association of attributes.</b>	Introduction, definition, notations- meaning and methods of association. Yule's coefficient of association and its applications	5 Hours	Students will be able to understand and measure the type of relation between two attributes and to know whether they are dependent or independent.	Using Yule's coefficient of Association, measurement and interpretation.
8	To estimate the unknown value of dependent variable for a given value of independent variable which is within/outside the limits of the independent variable	<b>VIII Interpolation and Extrapolation</b>	Meaning and utilities of interpolation and extrapolation. Binomial expansion method of interpolation and Extrapolation. Merits and demerits, applications.	5 Hours	To apply the Binomial expansion method in interpolating a missing value.	Finding a missing value using Binomial expansion method by using Binomial coefficient $s$ as in Pascal's triangle
9	We often hear statements about chance of occurrence of events. What is their precise meaning? How to measure chance? In what sense are probabilistic statements different from mere conjectures? The above questions will be answered in this chapter.	<b>IX Theory of Probability</b>	Introduction, definitions-Deterministic experiment, Random experiment, Sample space, types of events with examples. Meaning and definitions of Classical, Empirical and Axiomatic approaches. $P(\emptyset) = 0, P(S) = 1, 0 \leq P(A) \leq 1, P(A)+P(A') = 1$ , Statement and proofs of addition and multiplication theorems and applications.	14 Hours	Students are able to express the uncertainty of happening of an event in numerical way. Like getting a spade card from a pack of cards, selecting two girls from a group 10 students etc.,	Problems on, finding probability with regard to classical definition, addition and multiplication theorems.
10	In this chapter we introduce the concept of random variable-values of the variable with their corresponding probabilities. Mean, variance and standard deviation of probability distributions of a random variable, which have the same interpretation as those of the corresponding concept of frequency distribution.	<b>X Random Variable and Mathematical expectation of a discrete random variable:</b>	Definition and types of random variable. Definition of probability mass function and probability density function. Bivariate and marginal probability distributions, definitions with examples. Definition of mean, variance and standard deviation of a discrete random variable. Related functions defined on a discrete random variable and applications Statement and proofs of addition and multiplication theorem of Expectation. Covariance and correlation coefficient of bivariate random variables.	14 Hours	Students are able to write down the probability distributions of several discrete random variables and to also compute their means and variances. To compute coefficient of correlation for a Bivariate random variables.	Formation of discrete probability distributions. And to find mean, variance, standard deviation and coefficient of correlation of given probability distributions.