

**SRI VENKATESWARA UNIVERSITY - TIRUPATHI**  
**B.A. / B.Sc., STATISTICS (NON- MATHEMATICS)**  
**REVISED SYLLABUS FOR CORE COURSES**  
**CBCS / SEMESTER SYSTEM (w.e.f.2020-21 ADMITTED BATCH)**  
**COURSE STRUCTURE (SEMESTER-I TO SEMESTER-IV)**

Semester	Paper	Title of course	Credits	Hrs	Marks		
					IA	SEE	Total
<b>I</b>	<b>I</b>	<b>Paper - I Elementary Mathematics</b>	<b>4</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
		<b>Practical- 1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
<b>II</b>	<b>II</b>	<b>Paper II - Descriptive Statistics</b>	<b>4</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
		<b>Practical-2</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
<b>III</b>	<b>III</b>	<b>Paper - III Statistical Methods and Probability</b>	<b>4</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
		<b>Practical-3</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
<b>IV</b>	<b>IV</b>	<b>Paper-IV Probability Distributions, Correlation and Regression</b>	<b>4</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
		<b>Practical-4</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>
	<b>V</b>	<b>Paper - V Statistical Applications</b>	<b>4</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
		<b>Practical-5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>50</b>	<b>50</b>

## **OBJECTIVE OF THE COURSE**

Statistics is a key to success in the field of science and technology. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of statistical ideas and tools to use them effectively in modeling, interpreting and solving the real life problems. Statistics plays an important role in the context of globalization of Indian economy, modern technology, computer science and information technology.

### ***The main objectives of the course are***

- To build the basis for promoting theoretical and application aspects of statistics.
- To underline the statistics as a science of decision making in the real life problems with the description of uncertainty.
- To emphasize the relevance of statistical tools and techniques of analysis in the study of inter-disciplinary sciences.
- To acquaint students with various statistical methods and their applications in different fields.
- To cultivate statistical thinking among students.
- To develop skills in handling complex problems in data analysis and research design.
- To prepare students for future courses having quantitative components.

**SRI VENKATESWARA UNIVERSITY: TIRUPATHI**

**B.A./B.SC I YEAR : STATISTICS**

**(For Non - Mathematics Combination)**

**Semester - I CBCS**

**Paper-I :ELEMENTARY MATHEMATICS**

**Course Outcomes:**

After successful completion of this course, the student will be able to;

1. Have an idea about basic mathematical techniques which are necessary to analyze the Statistical techniques
2. Able to know the concepts of set theory and operations in sets .
3. Able to know the concept of matrices and its operations.
4. Able to complete the adjoint and determinate of a square matrix , hence its inverse.
5. Capable of solving the simultaneous equations using matrix method.
6. Understands the concept of finite differences.

**COURSE SYLLABUS:**

**UNIT-I :**

Types of matrices -Matrix addition and subtraction - Matrix multiplication-Transpose of a matrix, row matrix, column matrix, Symmetric and skew symmetric matrices.

**UNIT-II:**

Singular and Non-Singular Matrices, Determinant of a square matrix, Ad joint of a square matrix, Inverse of square matrix Up to 3 order only.

**UNIT-III:**

Definition of a Rank, Rank of a Matrix through determinant method up to 3 order only

**Solution of Linear Equations.**

(i) Algebraic Method

(ii) Cramer's Rule

(iii) Matrix Inversion Method

#### **UNIT – IV :**

Set, Subset, Types of Sets, Operations on sets, Demorgan Laws – statements only.

#### **UNIT-V:**

Finite Differences - Forward Differences - Backward differences.

Newton's forward interpolation formula - Newton's backward interpolation formula

**Note** :1. Concentration on numerical problems Only.

2. Proofs of theorems and Derivations of expressions are omitted.

#### **Text Books:**

1. Differential Calculus - Santhi Narayana.
2. Outlines of Matrices – Schaum.

#### **Reference Books:**

1. Statistical methods - S.P.Gupta.
2. Fundamentals of Mathematical statistics - SC Gupta and V.K.Kapoor.
3. Quantitative Techniques1 –Sulthan Chand Publication.

#### **Paper-1 Practical's:**

1. Addition, Subtraction of Matrices.
2. Multiplication of Matrices.
3. Adjoint of a Matrix
4. Inverse of a Matrix
5. Rank of a Matrix
6. Linear equations
7. Union and Intersection on sets
8. Operation on sets
9. Newton's forward interpolation formula
10. Newton's backward interpolation formula

**SV University : Tirupathi**  
**B.A/B.Sc I YEAR : STATISTICS MODEL PAPER**  
**(NON-MATHEMATICS COMBINATION)**  
**SEMESTER-I: PAPER-I**  
**ELEMENTARY MATHEMATICS**

(Statistical tables and Electronic Calculators are allowed)

TIME: 3 HOURS

MAX.MARKS:75

**SECTION-A**

ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 5 MARKS 5X5=25M

1. If  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$  then Prove that  $(A^T)^T = A$

2. If  $A = \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$  then find  $A^2 + A + I$

3. Define Singular Matrix. Write one example for Singular Matrix.

4. Classifying square matrices as singular or non-singular

$$A = \begin{bmatrix} 0 & 2 & -1 \\ 3 & -2 & 1 \\ 3 & 2 & -1 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 2 & -1 \\ 3 & -2 & 1 \\ 3 & 2 & 1 \end{bmatrix}$$

5. Define Rank of a Matrix. Find the Rank of  $\begin{bmatrix} 6 & 4 \\ 3 & 2 \end{bmatrix}$

6. Solve the following system of Linear equations.

$$2x + 3y = 8, 5x - y = -2$$

7. If  $A = \{5, 6, 7, 8, 9\}$ ,  $B = \{2, 4, 6, 8, 10\}$ , find (i)  $A \cup B$  (ii)  $A \cap B$  and examine they are equal or not

8. If  $A = \{3, 4, 5, 6, 7\}$ ,  $B = \{5, 6, 7, 8, 9\}$ , find (i)  $A - B$  (ii)  $B - A$  and examine they are equal or not.

9. Find the forward difference table for the following data

$x$	35	45	55	65	75
$y$	200	220	243	270	289

10. Construct backward difference table to the following data and find  $\nabla^2 y_2, \nabla^4 y_2$

$x$	0	1	2	3	4	5	6
$y$	0	1	16	81	256	625	1296

### SECTION-B

**ANSWER ANY FIVE QUESTIONS.EACH QUESTION CARRIES 10 MARKS 5X10=50**

11.a)  $A = \begin{bmatrix} 1 & 2 \\ 0 & 5 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 5 \\ 1 & 0 \end{bmatrix}$  then find (i)  $AB$  (ii)  $BA$  (iii)  $A + B$  (iv)  $(A + B)^T$  (v)  $A - B$

(OR)

b). Evaluate  $A^2 - 3A + 9I$  where  $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$  and  $I$  is the unit Matrix.

12.(a) If  $A = \begin{bmatrix} 2 & 0 & 1 \\ 4 & -2 & 3 \\ 0 & 4 & -1 \end{bmatrix}$  then find  $|A|$  and  $\text{adj}A$

(OR)

(b) Find the Inverse of  $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 1 \\ 2 & 1 & 2 \end{bmatrix}$

13. (a) If  $A = \begin{bmatrix} 3 & -2 & 1 \\ 0 & 1 & 5 \\ 4 & 2 & 6 \end{bmatrix}$  then find Rank of  $A$

(OR)

(b). Solve the equations by using Cramer's Rule  $x - y + z = 3, 2x + y + z = 4, 3x + y - 2z = 2$

14.(a) If  $\mu = \{1, 3, 5, 7, 9, 11\}, A = \{3, 5, 7, 11\}, B = \{1, 5, 7, 11\}$  then find

(i)  $A \cup \mu$  (ii)  $B \cup \mu$  (iii)  $A \cap \mu$  (iv)  $B \cap \mu$  (v)  $A^1$  (vi)  $B^1$  (OR)

(b). If  $\mu = \{1, 2, 3, 4\} A = \{2, 4\}$  then show that (i)  $A \cup A^1 = \mu$  (ii)  $A \cap A^1 = \phi$

15(a). Find  $f(1.6)$  using Newton's forward Interpolation formula from the following table

$x$	1	1.4	1.8	2.2
$y$	3.49	4.82	5.96	6.5

(OR)

(b).Find  $f(3.5)$  by Newton's Backward Interpolation formula from the following data

$x$	0	1	2	3	4
$y$	3	4	7	8	10