

SRI VENKATESWARA UNIVERSITY
BCA (DATA SCIENCE) – W.E.F. 2023-24
SEMESTER – II

Sl.No.	Course	Name of the Subject	Total Marks	Internal Exam	Sem. End Exam	Teaching Hours	Credits
1.	First Language	English	100	25	75	4	3
2.	Second Language	(Telugu / Hindi / Sanskrit / Tamil / Urdu)	100	25	75	4	3
3.	Skill Enhancement Course-1		50	---	50	2	2
4.	Skill Enhancement Course-2		50	---	50	2	2
5.	Major - Course 3	Statistical Foundation for Data Science	100	25	75	3	3
6.	Major - Course 3	Statistical Foundation for Data Science Practical Course	50	---	50	2	1
7.	Major - Course 4	Programming in C	100	25	75	3	3
8.	Major - Course 4	Programming in C Practical course	50	---	50	2	1
9.	Minor		100	25	75	3	3
10.	Courses with Practicals		50	---	50	2	1

Programme: BCA DATA SCIENCE Honours

(MAJOR)

II Semester Course Structure

W.E.F. AY 2023-24

Year	Semester	Paper	Title of the Course	No. of Hrs./ Week	No. of Credits
1	II	3	Statistical Foundation for Data Science	3	3
			Statistical Foundation for Data Science Practical course	2	1
		4	Programming in C	3	3
			Programming in C Practical course	2	1

SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA (DATA SCIENCE)
SEMESTER-II

(MAJOR)

COURSE 3: STATISTICAL FOUNDATION FOR DATA SCIENCE
(w.e.f. 2023-24)

Theory

Credits: 3

3 hrs/week

Course Objectives

Statisticians help to design data collection plans, analyze data appropriately and interpret and draw conclusions from those analyses. The central objective of the Statistics is to equip students with consequently requisite quantitative skills that they can employ and build on inflexible ways.

Course Outcomes

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

- 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 in diagrammatic representation.
- Brief analysis of Different Types Of Data And Tabulated.
- Knowledge of various types of data, their organisation and evaluation summary measures such as measures of central tendency and dispersion etc.
- Insights into preliminary exploration of different types of data.

UNIT-I

Introduction to Statistics: Introduction of Statistics-Sources of data-techniques of data collection-primary data and secondary data-method of collecting primary data and secondary data-classification of data-frequency distribution.

UNIT-II

Diagrammatic and graphic representation: Introduction-significance of diagrams and graphs difference between diagrams and graphs- general rules for constructing diagrams-Bar diagrams – Pie charts – histogram – frequency polygon–ogive curves.

UNIT-III

Measures of Central Tendency: Introduction-features of a good average– Arithmetic Mean, merits and demerits – Arithmetic mean individual observation, discrete series, continuous series –Median, merits and demerits – median individual observation, discrete series, continuous series –Mode, merits and demerits–Mode Individual Observation, discrete series, continuous series.

UNIT-IV

Measures of Dispersion : Introduction – properties of a good measures of dispersion. Methods of studying dispersion-Range, Quartile deviation, Mean deviation, Standard deviation-Coefficient of Variation.

UNIT-V

Skewness: Concept of Skewness, Karl Pearsons coefficient of skewness, Bowley's Coefficient of skewness, kurtosis and their measures.

Note:1. Concentration Numerical Problems Only.

2. ProofsoftheoremsandDerivationsofexpressionsareomitted.

Text Books:

1. Statistical Methods-S.P.Gupta.
2. Fundamentals of Mathematical statistics-SC Gupta and VK.Kapoor

ReferenceBooks:

QuantitativeTechniques1–Sultan Chand Publication

SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA (DATA SCIENCE)
SEMESTER-II

(W.E.F. 2023-24)

Course 3 P: STATISTICAL FOUNDATIONS FOR DATA SCIENCE LAB
Practicals Credits: 1 2 hrs/week

1. Frequency Distribution Table
2. Bardiagrams.
3. Piediagram.
4. Histogram.
5. ArithmeticMean, Median.
6. Mode.
7. Mean Deviation
8. Standard Deviation.
9. Karl Pearson's Coefficient of Skewness.
10. Bowley's Coefficient of Skewness.

BCA DATA SCIENCE
CorePaper 3: STATISTICAL FOUNDATION FOR DATA SCIENCE
II SEMESTER

w.e.f.2023-24)

MODEL QUESTION PAPER

Time:3hours

Marks:75 marks

NOTE: Statistical tables and Electronic Calculators are allowed

PART -A

Answer any *Five* of the following question.

(5X3=15M)

1. Characteristics features of statistics
2. Primary and Secondary data
3. Draw a simple bar diagram

Countries	India	Germany	UK	China	Newzeland	Sweden
Birth rates '000'	33	16	20	40	30	15

4. Draw a Pie Diagram

Item	Food	Clothing	Shelter	Others
Expenditure	20%	25%	35%	20%

5. Calculate the value of Median from the following data

39	384	591	407	672	522	777	753	2488	1490
1									

6. In a moderately symmetrical distribution the Mode and Median are 20 and 20 respectively. Calculate the Mean.

7. Calculate Range and its Co-efficient

Marks	10	20	30	40	50	80
No. of Students	4	7	15	8	7	2

8. If $Q_1 = 40$ and $Q_3 = 90$ Find Quartile Deviation and its Co-efficient

9. If Mean = 40, Median = 30, S.D = 20 Find Karl Pearson's Co-efficient of Skewness.

10. If Median is 30; Q_1 is 20 and Q_3 is 40 Find Bowley's Co-efficient of Skewness.

PART- B

Answer any Five of the following question.

(5X12=60M)

11. Construct a Frequency Distribution table by taking marks are 0-10, 10-20,..60-70. The marks scored by 25 students are given below

Marks: 18, 24, 32, 40, 48, 52, 59, 60, 09, 11, 05, 13, 26, 30, 41, 50, 52, 62, 19, 23, 36, 50, 51, 46, 33

12. Following figures give the ages of newly married husbands and their wives in years.

Represent the data by a two-way frequency distribution table.

Ages of Husband	24	26	27	25	28	24	27	28	25	26	25	26	27	25	27	26	25	26	26	26
Ages of Wives	17	18	19	17	20	18	18	19	18	19	17	18	19	19	20	19	17	20	17	18

13. Draw a subdivided bar diagram

Year	Public Companies	Private Companies	Total
2019	5000	20,000	25,000
2020	4000	16,000	20,000
2021	7,000	21,000	28,000

14. Draw a Histogram.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	5	8	9	12	14	20	16	12	9	6

15. Calculate Arithmetic Mean

Temperature in °C	-40 to -30	-30 to -20	-20 to -10	-10 to 0	0 to 10	10 to 20	20 to 30
No. of Days	10	28	30	42	65	180	10

16. Calculate Median

Class	0-100	100-200	200-300	300-400	400-500	500-600	600-700
Frequency	14	16	20	40	20	16	14

17. Calculate Mean Deviation from Mean

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	4	6	10	20	10	6	4

18. Calculate Standard Deviation

Class	0-20	20-40	40-60	60-80	80-100
Frequency	5	10	12	18	15

19. Find Karl Pearson's Co-efficient of Skewness

Class	0-10	10-20	20-30	30-40	40-50
Frequency	2	3	8	4	3

20. Find Bowley's Co-efficient of Skewness

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	4	6	10	20	4	6

SRI VENKATESWARA UNIVERSITY::TIRUPATI

Common to all BCA Honours

**General/Data Science/Big Data/Artificial Intelligence/Cloud
Computing**

Semester-II - (MAJOR)

Course 4. Programming in C

(w.e.f. 2023-24)

Theory

Credits: 3

3 hrs/week

I. Learning Outcomes: Upon Successful Completion of The Course,
A Student Will Be Able to:

1. Understand the evolution and functionality of a Digital Computer.
2. Apply logical skills to analyse a given problem
3. Develop an algorithm for solving a given problem.
4. Understand “C” language constructs like Iterative statements, Array processing, Pointers, etc.
5. Apply “C” language constructs to the algorithms to write a “C” language program.

II Syllabus

UNIT I

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages – Programming methodologies(paradigms) -

Introduction to C: Introduction– features of C – Structure of C Program – Writing the first C Program – Files used in C Program – Compiling and Executing C Programs.

UNIT II

Programming Constructs: Tokens – Using Comments – Basic Data Types in C – Variables – I/O Statements in C - Operators in C- Programming Examples.

Decision Control and Looping Statements: Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Goto Statement.

UNIT III

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multidimensional arrays.

Strings: Declaring and Initializing string variables, character and string handling functions.

UNIT IV

Functions: Introduction – Function declaration/ prototype – Function definition – function call – return statement – Categories of functions - Recursion - Parameter Passing techniques - Scope of variables – Storage Classes.

Pointers: Introduction to Pointers – declaring and initializing pointer Variables – accessing values using pointers - Pointer Arithmetic – Dynamic Memory Allocation.

UNIT V

Structures and Unions: Introduction – Structure definition - accessing structure members –Array of Structures - union definition – difference between structures and unions, Enumerated Data types.

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Command Line Arguments.

III. References:

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The „C“ Programming language” - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us „ C“ – BPB Publications.

IV. Recommended Co-Curricular Activities:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

B. General

1. Group Discussion
2. Try to solve MCQ"s available online.
3. Others

Semester-II
4. Programming in C

Practicals Credits:1

2 hrs/week

List of suggested programs :

1. Write a program to check whether the given number is Armstrong or not.
2. Write a program to find the sum of individual digits of a positive integer.
3. Write a program to generate the first n terms of the Fibonacci sequence.
4. Write a program to find both the largest and smallest number in a list of integer values
5. Write a program to demonstrate reflection of parameters in swapping of two integer values using **Call by Value & Call by Address**
6. Write a program that uses functions to add two matrices.
7. Write a program to calculate factorial of given integer value using recursive functions
8. Write a program for multiplication of two M X N matrices.
9. Write a program to perform various string operations.
10. Write a program to search an element in a given list of values.
11. Write a program to sort a given list of integers in ascending order.
12. Write a program to calculate the salaries of all employees using **Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary)** structure.
 - a. DA is 30 % of Basic Pay
 - b. HRA is 15% of Basic Pay
 - c. Deduction is 10% of (Basic Pay + DA)
 - d. Gross Salary = Basic Pay + DA+ HRA
 - e. Net Salary = Gross Salary – Deduction
13. Write a program to illustrate pointer arithmetic.
14. Write a program to read the data character by character from a file.
15. Write a program to create **Book (ISBN, Title, Author, Price, Pages, Publisher)** structure and store book details in a file and perform the following operations

- a. Add book details
- b. Search a book details for a given ISBN and display book details, if available
- c. Update a book details using ISBN
- d. Delete book details for a given ISBN and display list of remaining Books

MODEL QUESTION PAPER
SEMESTER – II
COURSE 4: PROGRAMMING IN C
(w.e.f. 2023-24)

Time :3Hrs

Max Marks 75

SECTION - A

Answer any Five of the following

5 X 3= 15 Marks

1. Short answer question from Unit-1
2. Short answer question from Unit-1
3. Short answer question from Unit-2
4. Short answer question from Unit-2
5. Short answer question from Unit-3
6. Short answer question from Unit-3
7. Short answer question from Unit-4
8. Short answer question from Unit-4
9. Short answer question from Unit-5
10. Short answer question from Unit-5

SECTION – B

Answer any Five of the following

5 X 12= 60 Marks

11. Long answer question from Unit-1
12. Long answer question from Unit-1
13. Long answer question from Unit-2
14. Long answer question from Unit-2
15. Long answer question from Unit-3
16. Long answer question from Unit-3
17. Long answer question from Unit-4
18. Long answer question from Unit-4
19. Long answer question from Unit-5
20. Long answer question from Unit-5

Note: **The question paper setter is requested to set question paper based on a model question paper and ensuring coverage across all units equally.**