SRI VENKATESWARA UNIVERSITY
BCA DEGREE COURSE IN DATA SCIENCE

FIRST YEAR - SECOND SEMESTER
(Syllabus under CBCS w.e.f. 2020-21)

Core Course Paper – C4: STATISTICAL FOUNDATION FOR DATA SCIENCE
(Total hours of teaching – 60 @ 04 Hrs./Week Credits 3)

Course Objectives

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

2. Majors are expected to learn concepts and tools for working with data and have experience in analyzing real data that goes beyond the content of a service course in statistical methods for non-majors. Majors should understand [1] the fundamentals of probability theory, [2] statistical reasoning and inferential methods, [3] statistical computing, [4] statistical modeling and its limitations, and have skill in [5] description, interpretation and exploratory analysis of data by graphical and other means; [6] graduates are also expected to learn to communicate effectively.

Course Outcomes

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

1. Knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.

2. Knowledge of various types of data in diagrammatic representation.

3. Brief analyzing in different types of data and tabulated.

4. Knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.

5. 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-methods 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 – technique of construction of graphs – 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 I: Introduction – properties of a good measures of dispersion-methods of studying dispersion-Range, Quartile deviation, Mean deviation(MD), Variance, Standard deviation (SD), its merits and demerits, calculation for Individual observation, calculation on discrete and continuous Series-Coefficient of Variation.

UNIT-V

Moments: Central and Non - Central moments, Sheppard's correction for moments for grouped data. Concept of Skewness, Karl pearson's coefficient of skewness, Bowley's Coefficient of skewness, kurtosis and their measures.

Note:

1. Concentration on numerical problems only.
2. Proofs of theorems and Derivations of expressions are omitted.

Text Books:

1. Statistical methods - S.P. Gupta.
2. Fundamentals of Mathematical statistics - SC Gupta and V.K. Kapoor

Reference Books:

Quantitative Techniques1 –Sulthan Chand Publication

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Practical Paper – C4P: STATISTICAL FOUNDATION FOR DATA SCIENCE LAB
(Total hours of teaching – 30 @ 02 Hrs./Week Credits 2)

1. Frequency distribution table

2. Bar diagrams.

3. Pie diagram.

4. Histogram.

5. Arithmetic Mean, Median.

6. Mode.

7. Mean Deviation

8. Standard Deviation.

9. Karl Pearson's Coefficient of Skewness.

10. Bowley's Coefficient of Skewness.

SRI VENKATESWARA UNIVERSITY
BCA DEGREE EXAMINATION IN DATA SCIENCE

FIRST YEAR - SECOND SEMESTER
(Syllabus under CBCS w.e.f. 2020-21)

Core Paper - C4: STATISTICAL FOUNDATION FOR DATA SCIENCE
(Statistical tables and Electronic Calculators are allowed)

MODEL QUESTION PAPER

Time: 3 hours   Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks

PART – A

Answer any _Five_ of the following question.   **(5X5=25M)**

1	
2	
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PART – B
Answer All The Questions. Each question carries 10 marks   **(5X10= 50M)**

9	(A)	
		OR
	(B)	
10	(A)	
		OR
	(B)	
11	(A)	
		OR
	(B)	
12	(A)	
		OR
	(B)	
13	(A)	
		OR
	(B)	

Core Course Paper – C5: DATA ANALYTICS USING SQL
(Total hours of teaching – 60 @ 04 Hrs./Week Credits 3)

Course Objectives:

1. The objective of the course is to introduce the design and development of databases for data science with analytical features in relational databases.

Course Learning Outcomes:
Upon successful completion of the course, a student will be able to:
1. Gain knowledge of Database, DBMS and SQL.
2. Learn SQL as best analysis tool for extract data in different ways
3. Create a small database using SQL.
4. Able to construct SQL queries to Store, Retrieve data in database
5. Model database using ER Diagrams and design database schemas based on the model.

UNIT -I

Introduction to Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, Classification of Database Management Systems, advantages and disadvantages of database approach, services of database systems, Components of Database Management System.

UNIT -II

The Relational Database Model: Various Data Models, Relational Database model, Keys used in Relational model, Relational Data Integrity, Relationships within the Relational Database, Codd's relational database rules.

Entity–Relationship Model: Introduction, The components of an Entity–Relationship model, entities, attributes, relationships, Classification of Entity Sets, Attribute Classification, Relationship Degree, Relationship Classification

UNIT- III

Structured Query Language: Introduction, SQL literals, Data types in SQL, SQL operators, Commands in SQL, Data Definition Language (DDL) commands, Creating tables, Table Modification, Table Truncation, Creating Tables with constraints, Dropping tables, Data Manipulation Language (DML) commands: Inserting data into tables, updating data in tables and deleting data in tables. Transaction Control commands in SQL

UNIT- IV

Queries, Aggregate Functions, Subqueries and correlated queries, Relational Set Operators, Joining Database Tables, SQL Functions: Numeric functions, Date & Time functions, Text functions and Conversion functions, Views, Types of views, creating views, dropping views, Data Control Language (DCL) commands

UNIT- V

PL/SQL: Introduction, Structure of PL/SQL program, PL/SQL Data Types, operators used in PL/SQL, variables, declaring variables in PL/SQL, Creating and running a PL/SQL Program, Control Structures, Conditional control statements, Iterative Control statements, Cursors, types of cursors, Steps to create a Cursor, using cursors in PL/SQL program

Text Books:

1. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)
2. SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, BPB publications

Reference Books:

1. Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley (2007).
2. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill
3. Database Management Systems by Raghu Ramakrishnan, McGrawhill
4. SQL: The Ultimate Beginners Guide by Steve Tale.
5. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, Eight Edition, Pearson Education (2006).
6. Atul Kahate, Introduction to Database Management Systems, Pearson Education (2006).

Practical Paper – C5P: DATA ANALYTICS USING SQL LAB
(Total hours of teaching – 30 @ 02 Hrs./Week Credits 2)

1. Draw ER diagram for inventory control system

2. Draw ER diagram for hospital administration

3. Illustrate the creation of a table with constraints

4. Creation of college database and establish relationships between tables

5. Employee database

   An enterprise wishes to maintain a database to automate its operations. Enterprise divided into certain departments and each department consists of employees. The following two tables describes the automation schemas

   Dept (deptno, dname, loc)

   Emp (empno, ename, job, mgr, hiredate, sal, comm, deptno)

   Generate the following queries using data of above tables.

   i.   List out all employees details

   ii. Display empno, ename, job and sal columns of all employees

   iii. Display employee details who are working as 'CLERK'

   iv. Find out number of employees working in each department

   v.   Find out job wise total salaries and number of employees.

   vi. Calculate HRA as 30% and DA as 65% of salary

6. Create a view to get details of a table

7. Demonstrate the use of GRANT and REVOKE commands to provide authorization

8. Write a PL/SQL program to find factorial of a number

9. Write a PL/SQL program to find sum of digits of an integer

10. Write a PL/SQL program to demonstrate a for loop

11. Write a PL/SQL program to demonstrate cursors

12. Write a PL/SQL program to demonstrate Aggregate functions

FIRST YEAR - SECOND SEMESTER
(Syllabus under CBCS w.e.f. 2020-21)

Core Paper - C5: DATA ANALYTICS USING SQL
(Statistical tables and Electronic Calculators are allowed)

MODEL QUESTION PAPER

Time: 3 hours   Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks

PART – A

Answer any _Five_ of the following question.   **(5X5=25M)**

1	
2	
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PART – B
Answer All The Questions. Each question carries 10 marks   **(5X10= 50M)**

9	(A)	
		OR
	(B)	
10	(A)	
		OR
	(B)	
11	(A)	
		OR
	(B)	
12	(A)	
		OR
	(B)	
13	(A)	
		OR
	(B)	

Core Course Paper – C6: JAVA PROGRAMMING FOR DATA SCIENCE
(Total hours of teaching – 60 @ 04 Hrs./Week Credits 3)

Course Objectives:

1. As the business environment becomes more sophisticated, the software development is becoming increasingly complex. Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand the concept and underlying principles of Object-Oriented Programming

2. Understand how object-oriented concepts are incorporated into the Java programming language

3. Develop problem-solving and programming skills using OOP concept

4. Understand the benefits of a well structured program

5. Develop the ability to solve real-world problems through software development in high-level programming language like Java

6. Develop efficient Java applets and applications using OOP concept

UNIT - I

FUNDAMENTALS OF OOP: Introduction, Object Oriented paradigm, Basic Concepts of OOP

OVERVIEW OF JAVA LANGUAGE: Introduction, Java features, Java program structure, Java tokens, Implementing a Java Program, Java Virtual Machine (JVM), Command line arguments.

CONSTANTS, VARIABLES & DATA TYPES: Introduction, Constants, Data Types, Variables, Declaration of Variables, Giving Value to Variables, Scope of variables, Type casting, operators.

UNIT - II

INPUT AND OUTPUT IN JAVA: Reading Input with Java.util.Scanner Class, Displaying Output with System out print In.

CONTROL STATEMENTS IN JAVA: Conditional control statements (simple if, if..else, switch), Iterative control statements (while, do..while, for), break Statement, continue Statement, return Statement.

CLASSES, OBJECTS & METHODS: Introduction, Defining a class, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members

UNIT - III

ARRAYS, STRINGS AND VECTORS: Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes.
INHERITANCE: Introduction, Types of inheritance, Overriding methods, Final variables and methods, Final classes, Abstract methods and classes.

UNIT - IV

INTERFACES: Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface variables, Multiple Inheritance using interfaces.

EXCEPTIONS: Types of errors: Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements.

UNIT - V

MULTITHREADED PROGRAMMING: Introduction, Lifecycle of a Thread, Creating Threads, Extending the Threads, Stopping and Blocking a Thread.

APPLET PROGRAMMING: Definition, Local and remote applets, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state, Building Applet code.

PACKAGES: Introduction, Java API Packages, Creating Packages, Accessing a Package

Text Books:

1. E.Balaguruswamy, Programming with JAVA, A primer 3e, TATA McGraw-Hill Company

Reference Books:

1. Programming in Java by Sachin Malhotra, OXFORD University Press

2. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao &Kogent Learning Solutions Inc.

3. John R. Hubbard, Programming with Java, Second Edition, Schaum"s outline Series, TATA McGraw-Hill Company.

4. Deitel & Deitel. Java TM: How to Program, PHI (2007)

5. Java Programming: From Problem Analysis to Program Design- D.S Mallik

6. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)

Practical Paper – C6P: JAVA PROGRAMMING FOR DATA SCIENCE LAB
(Total hours of teaching – 30 @ 02 Hrs./Week Credits 2)

1.   Java program to demonstrate the use of Harmonic Series.

2.   Java program to display a number is even or odd

3.   Java Program to find whether a number is prime or not

4.   Java program to find a sub string in the given string.

5.   Java program to arrange the given strings in Alphabetic Order.

6.   Java Program to search an element using arrays

7.   Java program to implement Addition and multiplication of two Matrices.

8.   Java program to demonstrate the use of Constructor.

9.   Java program to demonstrate the use of overriding Method.

10. Java program for single Inheritance.

11. Java program for implementing Interface.

12. Java program on Multiple Inheritance.

13. Java program for to implement Thread

14. Java program to demonstrate Exception handling.

15. Java program to demonstrate Applet program.

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FIRST YEAR - SECOND SEMESTER
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Core Paper - C6: JAVA PROGRAMMING FOR DATA SCIENCE
(Statistical tables and Electronic Calculators are allowed)

MODEL QUESTION PAPER

Time: 3 hours   Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks

PART – A

Answer any _Five_ of the following question.   **(5X5=25M)**

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PART – B
Answer All The Questions. Each question carries 10 marks   **(5X10= 50M)**

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		OR
	(B)	