SRI VENKATESWARA UNIVERSITY
BCA (BIG DATA) Honours– W.E.F. 2024-25

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
II	III	5	Database Management System	3	3
			Database Management System Lab	2	1
		6	Mathematical and Statistical Foundation	3	3
			Mathematical and Statistical Foundation Lab	2	1
		7	JAVA and Data Structure	3	3
			JAVA and Data Structure Lab	2	1
		8	Big Data and Machine Learning	3	3
			Big Data and Machine Learning	2	1

Note: Course 5, 6, and 7 are common to all BCA specializations

COURSE 5: DATA BASE MANAGEMENT SYSTEM

Theory   **Credits: 3**   **3 hrs/week**

Course Objectives:

- Graduates will have the expertise in analyzing real time problems and providing appropriate solutions related to Computer Science & Engineering.
- Graduates will have the knowledge of fundamental principles and innovative technologies to succeed in higher studies and research.
- Graduates will continue to learn and to adapt technology developments combined with deep awareness of ethical responsibilities in profession.

Course Outcomes:

- An ability to apply Knowledge of computing and mathematics in Computer Science & Engineering.
- An ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
- An ability to design, implement and evaluate a computer-based system to meet desired needs with appropriate societal considerations.
- An ability to conduct investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science & Engineering.

- An ability to engage in continuing professional development and life-long learning.

UNIT–I

Overview of Database Systems: Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications.

Data Models: Introduction; types of data models, Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence;

Case Study:

1. Describe the differences between Database systems and File based systems
2. Study about data base models and their advantages and dis-advantages

UNIT–II

Relational Model: Introduction to relational model, Codd's rules, concepts of domain, attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints) and their importance, concept of keys (super key, candidate key, primary key, foreign key).

Normalization: Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency (1NF, 2NF, and3 NF), Boyce-codd normal form (BCNF)

Case Study: Describe Relational model and normalization for database design

UNIT–III:

Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, subclasses, superclass, inheritance, specialization, generalization using ERDiagrams.

BASIC SQL: Database schema, datatypes, DDL operations (create, alter, drop, rename), DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, aggregation, grouping, ordering.

Case Study:

   1.   Examine issues in data storage and query processing using SQL.
   2. Create, maintain and manipulate a relational database using SQL

UNIT–IV

SQL: Nested queries / subqueries, implementation of different types of joins, SQL functions (Date, Numeric, String, Conversion functions), Creating tables with relationship, implementation of key and integrity constraints, views, relational set operations, Transaction Control Language :commit, Rollback, Savepoint, DCL: Grant, Revoke

Case Study:

   1. Try to convert some sample data to information and show how it can you be used in decision making.

UNIT–V

PL/SQL: Introduction, PL/SQL program Structure, Data types, Control Structures, Cursors, Procedure, Function, Exception Handling, Triggers, Packages.

Case Study:

1. Study about Triggers and their usages.

Text Books

- Database Management Systems, 3^{rd}Edition , Raghurama Krishnan, Johannes Gehrke, TMH
- Database System Concepts,5^{th}Edition ,Silberschatz, Korth, TMH

Common to all BCA Honours

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

Computing

II Year III Semester

COURSE 5: DATABASE MANAGEMENT SYSTEM

PRACTICALS   Credits: 1   2 hrs/week

List of Experiments

SQL:

Cycle-I: Aim: Marketing company wishes to computerize their operations by using following tables.

Table Name: Client-Master
Description: Used to store client information

Column Name	DataType	Size	Attribute
			Primary key
NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESSS	Varchar2	30	
CITY	Varchar2	15	
PINCODE	Varchar2	8	
STATE	Varchar2	15	
BAL_DUE	Number	10,2	

Table Name: Product_Master

Description: Used to store product information

ColumnName	DataType	Size	Attribute
			Primary key
DESCRIPTION	Varchar2	15	Not null
	Number		
	Varchar2		
	Number		
	Number		
	Number		
	Number		

Table Name: Salesman_master

Description: Used to store salesman information working for the company.

ColumnName	Data Type	Size	Attribute
SALESMAN NO	Varchar	6	Primarukeu
SALESMAN NAME	Varchar	20	Not null
	Varchar		
	Varchar		
	Varchar		
	Number		
	Vachar2		
	Number		
	Number		
	Number		
	Varchar		

Table Name: SALES- ORDER

Description: Used to store client's orders

ColumnName	DataType	Size	Attribute
CLIENT NO	Varchar2	6	ForeignKey
	Date		
	Varchar2		
	Varchar2		
	Char		
	Char		
	Date		
	Varchar2		Values("InProcess","Fulfilled",

Table Name: SALES_ORDER_DETAILS

Description : Used to store client's order with details of each product ordered.

ColumnName	DataType	Size	Attribute
PRODUCT NO	Varchar2	6	Foreign Key references
	Number		
	Number		
	Number		

Solve the following queries by using above tables.
1. Retrieve the list of names, city and the state of all the clients.
2. List all the clients who are located in 'Mumbai' or 'Bangalore'.
3. List the various products available from the product_master table.
4. Find the names of salesman who have a salary equal to Rs.3000.
5. List the names of all clients having 'a' as the second letterin theirnames.
6. List all clients whose Baldueis greater than value 1000.

7. List the clients who stay in a city whose first letter is 'M'.
8. List all information from sales-order table for orders placed in the month ofJuly.
9. List the products whose selling price is greater than 1000 and less than orequal to3000.
10. Find the products whose selling price is greater than 1000 and also find the new selling price as original selling price 0.50.

Cycle-IISupplier

Aim: A manufacturing company deals with various parts and various suppliers supply these parts. It consists of three tables to record its entire information. Those are as follows.

Supplier (Supplier_No, Sname, City, status) Part(Part_no, pname, color, weight, city,cost) Shipment (supplier_No, Part_no, city) JX(project_no, project_name,city) SPJX(Supplier_no,part_no, project_no,city)

1. Get supplier numbers and status for suppliers in Chennai with status>20.
2. Get project names for projects supplied by supplier 'S'.
3. Get colors of parts supplied by supplier 'S'.
4. Get part numbers for parts supplied to any project in Mumbai.
5. Find the id's of suppliers who supply ared or pinkparts.

Cycle–III EmployeeDatabase

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

Emp(Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno)

Dept(Deptno, Dname,Loc)

1. List the details of employees who have joined before the end of September '81.
2. List the name of the employee and designation of the employee, who does not report to anybody.
3. List the name, salary and PF amount of all the employees (PF is calculated as 10% of salary)
4. List the names of employees who are more than 2 years old in the organization.
5. Determine the number of employees, who are taking commission.
6. Update the employee salary by 20%, whose experience is greater than 12 years.
7. Determine the department does not contain any employees.
8. Create a view, which contains employee name and their manager names working in sales department.
9. Determine the employees, whose total salary is like the minimum salary of any department.
10. List the department numbers and number of employees in each department.

PL/SQLPROGRAMS

1. Write a PL/SQL program to check the given string is palindrome or not.
2. The HRD manager has decide to raise the employee salary by 15% write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate message based on the existence of the record in Emp table.
3. Write a PL/SQL program to display top 10 rows in Emp table based on their job and salary.
4. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people and also maintain the raised details in the raise table.
5. Create a procedure to update the salaries of Employees by 20%, for those who are not getting commission

6. Write a PL/SQL procedure to prepare an electricity bill by using following table. Table used: Elect

Name	Null?	Type
MNNO	NOT NULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

7. Create a trigger to avoid any transactions (insert, update, delete) on EMP table on Saturday & Sunday.

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Common to all BCA Honours

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

II Year III Semester

(w.e.f. 2024-25)

<u>COURSE 5: DATABASE MANAGEMENT SYSTEM</u>

<u>Time : 3 Hrs</u>   <u>Max Marks : 75</u>

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

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II Year III Semester
COURSE6: Mathematical and Statistical Foundation
(w.e.f. 2024-25)

<u>**Theory**</u>   **Credits: 3**   **3 hrs/week**

Learning 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 statically technique.
    2. Able to know the concept of matrices and its operations.
    3. Able to complete the adjoint and determinate of a square matrix, hence it's inverse.
    4. Capable of solving the simultaneous equations using matrix method.
    5. Understands the technique differentiation, integration and its applications.

UNIT-I

Matrix Algebra-I: Introduction-Definition of Matrix–Various types of Matrices- Addition of Matrices-Subtraction of Matrices-Multiplication of Matrices and their applications. Transpose of a Matrix-Symmetric Matrix-Skew Symmetric Matrix Orthogonal Matrix-Singular Matrix-Non SingularMatrix.

UNIT-II

Matrix Algebra- II: Determinant of a Matrix- Adjoint of a Square Matrix - Inverse of a Matrix up to3 order only, Rank of a Matrix.

Solutions ofLinearequations: 1.Matrix inversion method 2. Cramer's Rule upto3 order only

UNIT-III

Set Theory: Definition of Set-Types of Sets-Union of Sets-Intersection of Sets-Venn diagrams-Operations on Sets-Complement of Set-Distributive Laws-De'Morgan's Laws.

<u>**Note:**</u>

1. Concentration on numerical problems only.

2. Proofs of theorems and Derivations of are omitted.

UNIT-IV

  Basics of Statistics: Classification – Tabulation - Frequency distribution table – One-way Frequency distribution table – Two-way Frequency distribution table

UNIT-V: Statistical Measures: Measure of averages – Mean – combined mean – Median – Quartiles- Deciles – Percentiles - Mode – Empirical relationship between mean, median and mode.

References:

TextBooks:

1.MathematicalMethodsbyDr.T.K.V.Ivengar,Dr.B.KrishnaGandhi,Dr.S.Ranganatham,andDr.M.V.S.S.N.PrasadbyS.Chand publications 6th revised edition2011.

2.QuantitativeTechniquesbyC.Satyadeviby S.chandCompany

   3. Statistical Methods by S.P. Gupta

SEMESTER-III

COURSE6:Mathematical and Statistical Foundation

Practicals   **Credits: 1**   **2 hrs/week**

List of Lab Experiments & simple implementation using any programming language

1. Addition, Subtraction of Matrices.
2. Multiplication of Matrices.
3. Determinant of a Matrix and Inverse of a Matrix.
4. Singular and Non-Singular Matrices.
5. Cramer's Rule and Matrix Inversion Method.
6. Rank of a Matrix.
7. Preparation of two – way frequency table
8. Problem on Histogram
9. Problem on Mean and Median.
10. Empirical relationship between mean, median and mode

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Common to BCA Honours
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II Year III Semester
COURSE6: **Mathematical and Statistical Foundation**
(w.e.f. 2024-25)

Theory   **Credits: 3**   **3 hrs/week**
Model Question Paper
Section - A
Answer any five questions each question carries equal marks
                                                                                5 X 3 = 15

1.What is the necessary condition for the addition of two matrices?

2.What is necessary condition for matrix multiplication?

3.Define inverse of a matrix?

4.If B = $\begin{bmatrix} 2 & -3 \\ 1 & 6 \end{bmatrix}$ then find transpose matrix

5.In a class of 40 students, 22 play hockey, 26 play basketball, and 14 play both. How many students do not play either of the games?

6.If set A = {1, 3, 5, 7, 9} and set B = {1, 2, 3, 4, 5}, find A ∪ B and A ∩ B.

7.Classification

8.Frequency Distribution

9. Mean=16;Median=18, Find Mode

10. Find Combined Mean
$\bar{x}_1 = 150; \bar{x}_2 = 160;$ N$_1$=60;N$_2$=40;

Section - B

Answer any five questions   **12 X 5 = 60**

11. Discuss laws of Matrix Algebra.
12. If A=$\begin{bmatrix} -3 & 8 \\ 3 & 5 \end{bmatrix}$andB= $\begin{bmatrix} 3 & -8 \\ 3 & -5 \end{bmatrix}$ find B-A

13. Find the transpose of: $\begin{bmatrix} 5 & 6 & -7 \\ 4 & 3 & 0 \\ -6 & 2 & 1 \end{bmatrix}$

14. Find the inverse of matrix shown below. $\begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}$

15. In a group of 120 people, 54 like Coca Cola and 84 like Pepsi and each person likes at least one of the two beverages. How many like both Coca Cola & Pepsi?

16. Write an example of equal sets.

17. Draw a frequency distribution table. 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

18. Following figures give the ages of newly married husbands and their wives in years.
Represent the data by a two-way frequency distribution.

28	24	27	28	25	26	25	26	27	25	27	26	2
20	18	18	19	18	19	17	18	19	19	20	19	1

19. Calculate Mean

x	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	4	6	10	20	10	6	4

20. Calculate Mode

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Frequency	14	16	20	40	20	16	14

Yours Truly
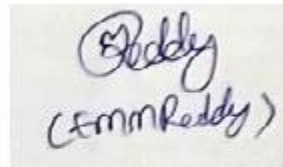
(A. Ravi Prasad)
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BOS Members

(B. Kanjitha)

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(EmmReddy)

(SK. MUNWAR)

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Common to all BCA Honours

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

II Year III Semester

(w.e.f. 2024-25)

<u>COURSE7:JAVA AND DATA STRUCTURES</u>

<u>Theory</u>   <u>Credits: 3</u>   <u>3 hrs/week</u>

Course Objectives:

To make the students understand the fundamentals of Java programming and organize and manage data, based on data structures for efficient access.

- To expose the students to Concepts of OOP and JAVA
- To make the students to design appropriate Exception Handling in Java
- Identifying various data structures and their real-time applications
- Implementing different sorting & searching techniques

Course Outcomes:

The student would become competent enough to write, debug, and document well-structured java applications

- Demonstrate good object-oriented programming skills in Java
- Able to describe recognize, apply, and implement selected design patterns in Java
- Understand the capabilities and limitations of Java
- Be familiar with common errors in Java and its associated libraries
- Develop excellent debugging skills

UNIT-I

Introduction to OOPS: Paradigms of Programming Languages – Basic concepts of Object Oriented Programming– Benefits of OOPs – Application of OOPs, History and Evolution of Java–Java features – Java Environment. Introduction to Java: Creating and Executing a Java program– Java Tokens–Data Types - Variables–Scope of variables–Type casting– Operators– control statements – arrays

Case Study:

Study the evolution of JAVA, why it was developed, and how it changed the software industry scenario.

Study the difference between the looping structured in JAVA and Programming in C.

UNIT – II

Class and objects: Defining a class–Methods–Creating objects–Accessing class members– Overloading methods – Constructors.

Inheritance: Defining inheritance–types of inheritance–Method overloading– Static members–this keyword–Overriding methods–Final variables and methods.

Interfaces: Defining interface–Extending interface – Implementing Interface

Case Study:

Study the limitation of Constructors in JAVA.
Study the inheritance types available in JAVA and try to identify the limitations

UNIT–III

Packages: Java API Packages–Defining a Package, System Packages– Naming Conventions– Creating & Package Member Access

Exception Handling: Types of Errors –Basics of Exception Handling-Advantages of Exception Handling – Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement

Applets: Introduction, Java applications versus Java Applets, Applet Life–cycle

Case Study:

Study the advantages of Package compared to Libraries in Procedural languages

UNIT–IV

Data structure: Introduction and Overview– Elementary Data Organization, Data Structures classification, Data Structure Operations.
Arrays – Sorting(bubble, selection, insertion, and quick) – Searching(linear and Binary)

Linear Data Structures: Linked Lists, Stacks and Queues, Implementation using arrays and Linked List

Case Study:

Linked list verses Arrays.
Application of Stacks, Queues.

UNIT–V

Trees – Basic Terminology - applications of trees - Binary trees, Representing and traversing binary trees, Binary Search Trees. **Graphs**– Terminology – applications of graphs, Sequential representation of Graphs, Linked representation of Graphs, Operations on Graphs, Traversing a Graph.

Case Study:

Applications of Trees and Graphs

TEXTBOOKS:

1. **Object Oriented Programming through Java,** Universities Press, byP. Radha Krishna.

2. E. Balagurusamy, "*Programming with Java*",TataMc-GrawHill,5thEdition.
3. Data Structures by Seymour Lipschutz,McGrawHill(Schaum'sOutlines).
4. Data Structures using C ,Second edition , Dr. ReemaThareja, Oxford UniversityPress.

REFERENCES:

- Herbert Schildt, "The complete reference Java",TataMc-GrawHill, 7th Edition.
- Theory and Problems of Data Structures by Seymour Lipschutz, McGraw Hill (Schaum'sOutlines)

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

II Year III Semester

(w.e.f. 2024-25)

COURSE7: JAVA AND DATA STRUCTURES

Practicals   **Credits: 1**   **2 hrs/week**

List of Lab Experiments

1. Write a program to print Biggest of 3 Numbers using Logical Operators.
2. Write a program to Test the Prime number.
3. Write a program to create a Simple class to find out the Area and perimeter of rectangle and box using super and this keyword.
4. Write a program to design a class account using the inheritance and static that's how all function of bank (withdrawal, deposit).
5. Write a program to handle the exception using try and multiple catch block.
6. Write a program to implement stack using arrays.
7. Write a program to implement queue using arrays.
8. Write a program to implement Sorting
9. Write a program to implement searching
10. Write a program to implement tree traversals
11. Write a program to implement binary search trees
12. Write a program to traversing a graph.

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II Year III Semester

(W.E.F. 2024-25)

COURSE 7: JAVA AND DATA STRUCTURE

<u>Time : 3 Hrs</u>   <u>Max Marks : 75</u>

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

BCA Big Data Honours

II Year III Semester

COURSE 8: Big Data and Machine Learning

(w.e.f. 2024-25)

Theory   **Credits: 3**   **3 hrs/week**

Course Objective

To understand the concepts of big data and also machine learning technologies.

This subject makes students to learn the current trends in data management and data analysis.

Course Outcomes

After completing this course, the student will be able to:

1. Learn tips and tricks for Big Data use cases and solutions.
2. Learn to build and maintain reliable, scalable, distributed systems with Apache Hadoop.
3. Able to apply Hadoop ecosystem components.
4. Ability to formulate **machine learning techniques to respective problems**

UNIT-I

BIG DATA: big data types, big data classification, big data handling techniques, Big data applications (Marketing, Healthcare, Banking)

SCALABILITY AND PARALLEL PROCESSING: Analytics Scalability to big data, massively Parallel processing, cloud computing.

UNIT– II

DESIGNING DATA ARCHITECTURE: Data architecture design, managing data for analysis

DATA STORAGE AND ANALYSIS: Big data storage, big data platform, big data analytics

USE CASES: Pattern for big data deployment, the fraud detection pattern, social media pattern, big data analysis in Facebook and Amazon

UNIT– III

INTRODUCTION OF MACHINE LEARNING: Overview of Machine learning, machine learning types (Supervised, unsupervised, semi supervised), issues in machine learning.

CLASSICAL DATA ANALYSIS: Mean, variance, correlation, Linear Regression

UNIT-IV

CONCEPT LEARNING: Introduction, a concept learning task, learning as search, version Space and candidate elimination algorithm. DECISION TREE LEARNING: - introduction, Representation, basic decision tree learning algorithm.

UNIT-V

Hadoop for Big Data: Definition, Features, comparison with RDBMS, Hadoop Ecosystem, HDFS architecture. R for Machine Learning-Introduction, features of R, data structure in R, performing data operations, performing data modeling in R. Python for Machine Learning – Introduction, features of Python, data structure in python.

Text Books:

1. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj Kamal, Preeti
Saxena 2019, Mcgraw-Hill Education
2. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge University Press.

References Books:

1. Chris Eaton, Dirk Deroos et al., "Understanding Big Data", McGraw Hill , 2012.
2. "BIG DATA IN PRACTICE" BY Bernard Marr.published by Wiley,1st Edition,2016
3. Tom Michel, Machine Learning, McGraw Hill, 1997
4. Tom White, "HADOOP" : The definitive Guide", O Reilly 2012.
5. Boris lublinsky, Kevin t. Smith Alexey Yakubovich, "Professional Hadoop
Solutions". Wiley, ISBN : 9788126551071, 2015.

6. ''python data analytics'' by Fabio Nelli , 2015

7. "Big data analytics with R and hadoop'' by vignesh prajapati, packt publishing, 2013.

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BCA Big Data Honours

II Year III Semester

COURSE 8: Data Science & Machine Learning

Practicals   **Credits: 1**   **2 hrs/week**

List of Lab Experiments
1. Steps to Installation of R Software in windows.
2. Demonstrate the Data Structures in R.
3. Steps to Installation of Python Software in windows.
4. Demonstrate the Data Structures in Python.
5. Steps to Installation of Apache Hadoop in windows.
6. Draw the Diagram for HDFS Architecture.
7. Implement Candidate Elimination Algorithm in Machine learning.
8. Implement Decision Tree classification Algorithm in Machine learning.
9. Write a program in R to find the mean value given from the list of values.
10. Write a program in R to find the variance value given from the list of values.

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BCA Big Data Honours

II Year III Semester

COURSE 8: Data Science and Machine Learning

(w.e.f. 2024-25)

<u>Time : 3 Hrs</u>   **<u>Max Marks : 75</u>**

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