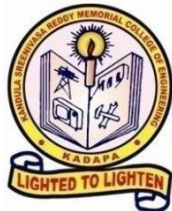


Department of Computer Science and Engineering

COURSE STRUCTURE

FOR

B.Tech CSE (III Sem) (R20 Regulations)



**KandulaSrinivasa Reddy Memorial College of Engineering (Autonomous)
Kadapa 516003 AP**

**(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC)
(An ISO 9001-2008 Certified Institution)**

COMPUTER SCIENCE AND ENGINEERING

Approved Course Structure

Semester - 3								
Subject Code	Subject Category	Course Name	L	T	P	IM	EM	CR
2024301	HS	Business Economics and Accounting for Engineers	3	0	0	40	60	3
2005302	PC	Advanced Data Structures	3	0	0	40	60	3
2005303	PC	Formal Languages and Automata Theory	3	0	0	40	60	3
2005304	PC	Object Oriented Programming through JAVA	3	0	0	40	60	3
2005305	PC	Database Management Systems	3	0	0	40	60	3
2005306	PC (LAB)	Advanced Data Structures Lab	0	0	3	40	60	1.5
2005307	PC (LAB)	Java Lab	0	0	3	40	60	1.5
2005308	PC (LAB)	Database Management Systems Lab	0	0	3	40	60	1.5
2005309	Skill Oriented Course	Exploring Data Analysis with R	0	1	2	40	60	2
2024310	Mandatory Course (AICTE Suggested)	Environmental Science	2	0	0	40	--	0
		Total						21.5

B.Tech III SEM CSE (R20)

Course Title	Business Economics and Accounting for Engineers				B.Tech CSE IV Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2024301	HS	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	40	60	100
Mid Exam Duration: 90 Minutes					End Exam Duration: 3Hrs			
Course Objectives: <ul style="list-style-type: none"> To equip the budding engineering student with an understanding of concepts and tools of economic analysis. To provide knowledge of Business economics through differential economics concepts and theories. To make aware of accounting concepts to analyze and solve complex problems relating financial related matters in industries. To understand professional and ethical responsibility and ability to communicate effectively. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand the concept of Business Economics and able to apply							
CO 2	Understand the Production functions and application of Business Economics and Accounts for making business decisions							
CO 3	To Analyze the markets conditions and determine price-output relations							
CO 4	To understand the concepts of Accounting and able to prepare the financial statement of a business firm.							
CO 5	To evaluate, analyze and interpret the financial performance of business							

UNIT - I: INTRODUCTION TO BUSINESS ECONOMICS

Meaning, Definition, Nature and scope of Business Economics, Demand Analysis: Concept of Demand, Determinants of demand, Law of Demand and its exceptions, Elasticity of Demand – Types, Measurement of Elasticity of Demand, Demand Forecasting – Techniques of Demand Forecasting.

UNIT - II: THEORY OF PRODUCTION AND COST ANALYSIS

Production Functions: Law of variable proportion, Isoquants and Isocost, least cost combination of inputs, Returns to Scale and Cobb- Douglas production function. Internal and external economies of scale.

Cost Analysis: Cost concepts – Break-Even Analysis (BEA) – Break Even Point – significance and limitations of BEA.

UNIT – III : CLASSIFICATION OF MARKETS AND PRICING METHODS

Markets structures: Perfect and Imperfect competition – Features of Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly. Price- Output determination under perfect competition, monopoly and monopolistic competition – Price rigidity in Oligopoly.

Methods of Pricing – cost plus pricing, marginal cost pricing, skimming pricing, penetration pricing, differential pricing and administrative pricing.

UNIT – IV: INTRODUCTION TO FINANCIAL ACCOUNTING

Definition to Accounting, objective and need for Accounting, Double Entry Book keeping – Accounting process, Journal Ledger, Trial Balance, and Final Accounts – Trading Account, Profit and Loss Account and Balance sheet with problems.

UNIT – V: FINANCIAL ANALYSIS THROUGH RATIOS

Concept of Financial Ratios , Types of Ratios – Liquidity Ratios, Turnover Ratios, Capital Structure Ratios, Profitability Ratios with problems.

TEXT BOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand Publishers, 2009.
2. Prasad and K.V.Rao: Financial Accounting, Jai Bharath Publishers, Vijayawada.
3. A.R. Aryasri: Managerial Economics and Financial Analysis, TATA McGraw-Hill Publishing Co. Ltd.

REFERENCES:

1. P.L Mehtha: Managerial Economics, Sulthan Chand Publishers
2. K K Dewett - Managerial Economics, S. Chand Publishers
3. S.P Jain & K.L Narang: Financial Accounting, Kalyani publishers.
4. M.Sugunatha Reddy: Managerial Economics and Financial Analysis, Research India Publication, New Delhi, 2013.
5. Paul A Samuleson and William nordhaus : Economics, Oxford University Publications.
6. M L Jhingan : Micro Economics & Macro Economics, Vrinda Publacations (P) Ltd.

Course Title	Advanced Data Structures					B.Tech CSE III Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005302	PC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	40	60	100
Mid Exam Duration: 90 Minutes					End Exam Duration: 3Hrs			
Course Objectives: <ul style="list-style-type: none"> To develop skills and analyze linear and non linear data structures. To understand basic concepts of stacks and queues. To study algorithms as they apply to trees and graphs. To study in detail about sorting, dictionaries and hashing. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand the variety of abstract data types and data structures.							
CO 2	Analyze data structures such as linked list, Stacks and Queues.							
CO 3	Apply and analyze tree traversal algorithms and graph traversal algorithms.							
CO 4	Analyze graph traversal algorithms and organize data using various sorting algorithms.							
CO 5	Ability to understand the concept of hashing, B-Trees and B+-Trees.							

UNIT-I

Introduction: Data structures, Primitive & Non Primitive data structures, Linear & Non Linear data structures, **Linear Lists:** Definition, **Arrays:** Definition, **Stacks:** Definition, Array & Linked representations, Operations, Applications

UNIT-II

Queues: Definition, Array & Linked representations, Operations, Circular Queues & Dequeues.

Trees: Basic terminology, Binary Trees- Definition, Properties, Representation, Complete and Full Binary Tree.

UNIT-III

Tree Traversal Algorithm: Inorder, Preorder and Post order.

Priority Queues: Definition, Heaps, Leftist Trees.

Binary Search Tree (BST): Definition, Operations & Implementations, BST with Duplicates, Indexed BST. **Balanced Search Trees:** AVL, Red-Black & Splay Trees.

UNIT-IV

Graphs: Terminology, Representations **Graph Traversal:** Depth First Search (DFS), Breadth First Search (BFS), Minimum Spanning Tree. **Sorting:** Quick, Merge, Heap.

UNIT-V

Dictionaries, Linear List Representation, Skip List Representation

Hashing: Introduction, Hash Table representation, Hash Functions.

Collisions: Introduction, Separate Chaining, Open Addressing, B-Trees, Operationson B-Trees,B+-Trees.

Textbooks:

1. An Introduction to Data Structures with applications, Jean Paul Trembley and Paul G.Sorenson, McGrawHill.
2. Fundamentals of Data Structures in C, Horowitz, Sahni, Anderson Freed, Universitiespress.
3. Data Structures, Algorithms and Applications in C++, Ananda Rao Akepogu and Radhik Raju Palagiri, Pearson Education.
4. Data Structures using C++,Varsha H.Patil, Oxford University Press.

Reference books:

- 1 Data Structures and Algorithmsin C++, S.Sahni, University Press (India) Private Limited, Second Edition.
- 2 Data Structures, Seymour Lipschutz, Schaum's Outlines, McGrawHill.
- 3 Data Structures and Algorithms, G.A.V.Pai, TataMcGraw Hill.
- 4 Data Structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
- 5 Data Structures and algorithms in C++,Mark Allen Weiss, Pearson Education Limited, Second Edition.

Course Title	Formal Languages and Automata Theory				B.Tech CSE III Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005303	PC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	40	60	100
Mid Exam Duration: 90 Minutes					End Exam Duration: 3Hrs			
Course Objectives: <ul style="list-style-type: none"> To be able to construct finite state machines and the equivalent regular expressions and prove the equivalence of languages described by finite state machines and regular expressions. To be able to construct push down automata and the equivalent context free grammars, Turing machines and Post machines. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand of the notion of a regular set and its representation by DFA's, NFA's and regular expressions.							
CO 2	Understand of the notion of a context-free language and its representation by							
CO 3	Identify the applications of regular expressions and context-free grammars							
CO 4	Understand the concept of Push Down Automata.							
CO 5	Solve to the problems using Turing machines.							

UNIT-I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

Finite Automata: NFA with ϵ transitions-Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without ϵ transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Mealy machines.

UNIT-II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

UNIT-III

Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, and sentential forms. Right most and left most derivation of strings.

Context Free Grammars: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL(proofs omitted).

UNIT-IV

Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT-V

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, Types of Turing machines (proofs not required).

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0)grammar, decidability of problems, Universal Turing Machine, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

Text Books:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education.
2. Introduction to Theory of Computation - Sipser 2nd edition Thomson

Reference Books:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation, John C Martin, TMH
3. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
- 4 Theory of Computer Science and Automata languages and computation -Mishra and Chandrashekar, 2nd edition, PHI. 5. Theory of Computation, By K.V.N. Sunitha and N.Kalyani

Course Title	Object Oriented Programming through JAVA				B.Tech CSE III Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005304	PC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	40	60	100
Mid Exam Duration: 90 Minutes					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To give the students a firm foundation on Java concepts like Primitive data types, Java control flow, Methods, Object-oriented programming, Core Java classes, packages and interfaces, multithreading. To provide the students with an understanding of Java applets, Abstract Window, Toolkit and exception handling. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Solve problems using object oriented approach and implement them using Java							
CO 2	Apply the concept of inheritance, polymorphism and Packages, Interfaces							
CO 3	Implement Exception handling and able to develop multithreaded applications with synchronization.							
CO 4	Able to develop applets for web applications.							
CO 5	Able to design GUI based applications							

UNIT-I

Object Oriented Programming basics: Need for OOP paradigm, Principles of OOP concepts.

Java Basics: History of Java, Java buzzwords, Simple java program, classes and objects – concepts of classes, objects, constructors, methods, Introducing access control, **this** keyword, overloading methods and constructors.

UNIT-II

Inheritance: Inheritance basics, Types of Inheritance, benefits of inheritance, **super** uses, using **final** with inheritance, polymorphism- method overriding, abstract classes.

Packages and Interfaces: Defining, Creating and Accessing a Package, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-III

Exception handling and multithreading: Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads.

UNIT-IV

Event Handling : Events, Event sources, Event classes, Event Listeners, Delegation event model, handling Mouse and Keyboard events, Adapter classes, The AWT class hierarchy, user interface components- Labels, Button, Scrollbars, Text Components, Check box, Choices, Graphics, Layout manager types – Flow, Border, Grid, Card and Grid bag.

UNIT-V

Applets: Concepts of Applets, differences between applets and applications, life cycle of an Applet, creating applets, passing parameters to applets.

Swings: Introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, and Tables.

Text Books:

1. Java; the complete reference, 7th editon, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

Reference Books:

1. An Introduction to programming and OO design using Java, J.Nino and F.A.Hosch, Johnwiley & sons.
2. An introduction to Java programming and object oriented application development, R.A.Johnson- Thomson.
3. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, eighth Edition,Pearson Education.
4. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, eighth Edition,Pearson Education.
5. Object Oriented Programming through Java, P. Radha Krishna, University Press.

Course Title	Database Management Systems				B.Tech CSE III Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005305	PC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	0	3	40	60	100
Mid Exam Duration: 90 Minutes					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To study the physical and logical database designs, database modeling, relational hierarchical, and network models. To understand and use data manipulation language to query, update, and manage database. To develop an understanding of essential DBMS concepts such as: database security, integrity and concurrency. . 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	To understand the basic concepts and the application of Database systems.							
CO 2	To understand the basics of SQL and construct queries using SQL							
CO 3	To understand the Relational Database design principles							
CO 4	To apply various Normalization techniques for database design improvement.							
CO 5	To apply concurrency control and recovery techniques during transaction execution.							

UNIT-I

Introduction - Database-System Applications, View of Data, Database languages, Database architecture, Database Users and Administrators.

E-R Model - The Entity Relationship Model, Constraints, Entity Relationship Diagrams, and Extended E-R features.

UNIT-II

Relational Model - Structure of Relational Databases, Database Schema, Keys, Query Languages, Fundamental Relational Algebra Operations, Additional Relational Algebra Operations, Extended Relational Algebra Operations, Modification of Database.

UNIT-III

Introduction to SQL - Data Definition, Basic Structure of SQL Queries, Set Operations, Null Values, Aggregate Functions, Nested Sub queries, Complex queries, views, Modification of the Database.

Advanced SQL -Integrity Constraints, Dynamic SQL, Functions and Procedures.
Other Relational Query Languages - Tuple Relational Calculus, Domain Relational calculus.

UNIT-IV

Normal Forms – Atomic domain and First Normal Form, Keys and Functional Dependencies, Second Normal Form, BCNF, BCNF and Dependency Preservation, Third Normal Form, Lossless Decomposition, Dependency- preserving, Multi valued Dependencies, Fourth Normal Form, Join Dependencies, Fifth Normal Form, and Inclusiondependencies.

UNIT-V

Transactions -Transaction Concept, Transaction State, Implementation of Transaction Atomicity and Durability, Concurrent Executions, Serializability.

Concurrency Control -Lock-Based Protocols, Timestamp-Based Protocols.

Recovery System - Failure Classification, Storage, Recovery and Atomicity, Log based recovery.

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database system Concepts", 5thEdition, McGrawhill.

❖ REFERENCE BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, Data base Management Systems. 3rd Edition, Tata McGrawHill.
2. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education.
3. Peter Rob, Ananda Rao and Carlos Corone, Database Management Systems, CengageLearning.
4. C.J.Date, Introduction to Database Systems.

❖ REFERENCE LINKS:

- <https://nptel.ac.in/courses/106/105/106105175/> (IIT KHARAGPUR)
<https://nptel.ac.in/courses/106/106/106106095/> (IIT MADRAS)

Course Title	Advanced Data Structures Lab				B.Tech CSE III Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005306	PC (Lab)	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs			
Course Objectives:								
<ol style="list-style-type: none"> 1. To implement linear and non-linear Data Structures. 2. To be able to understand the concept of Stacks and Queues. 3. To be able to understand the concept of trees and tree traversing methods. 4. To be able to understand graph traversal methods and various Sorting algorithms. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Implement the operations of various linear data structures.							
CO 2	Implement the ADT of Stack and Queue.							
CO 3	Implement the concept Inorder, Preorder and Postorder tree traversing techniques.							
CO 4	Analyze and implement the Graph traversing methods and Sorting algorithms.							

List of Experiments:

Exercise-1:

- a. Write a program to implement Transpose of a given matrix.
- b. Write a program to implement Matrix multiplication.

Exercise-2:

- a. Write a program to implement Stack operations using arrays.
- b. Write a program to convert Infix expression into Postfix expression.

Exercise-3:

- a. Write a program to implement Queue operations using arrays.
- b. Write a program to implement Circular Queue operations using arrays

Exercise-4:

Write a program to implement the tree traversal methods.

Exercise-5:

Write a program for Binary Search Tree to implement the following operations.

- i) Insertion
- ii) Deletion

Exercise-6:

- a) Write a program to implement Breadth First Search.
- b) Write a program to implement Depth First Search.

Exercise-7:

Write a program to implement Linear and Binary search using switch case.

Exercise-8:

- a. Write a program to implement Bubble Sort.
- b. Write a program to implement Insertion sort.

Exercise-9:

- a. Write a program to implement Quick Sort
- b. Write a program to implement Merge sort.

Exercise-10:

Write a program to implement Heap sort.

Course Title	JAVA Lab					B.Tech CSE III Sem (R20)		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005307	PC (Lab)	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To teach fundamentals of object oriented programming in Java. Understand various concepts of JAVA. To familiarize Java environment to create, debug and run simple Java programs. To be able to understand Primitive data types, Java control flow, Methods, classes, packages, multithreading and exception handling To be able to understand and implement Java applications and applets 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Create, compile, and run Java programs							
CO 2	Apply the concept of inheritance and polymorphism							
CO 3	Implement Packages, Interfaces and Exception handling							
CO 4	Develop windows applications both for standalone and Applets programs by using awt and swings.							

List of Experiments:

EXERCISE 1: (Basics)

- The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.
- Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer. (use Scanner class to read input)

EXERCISE 2 (Basics)

- Write a Java program to multiply two given matrices.
- Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)
- Write a Java program that checks whether a given string is a palindrome or not.
Ex: MADAM is a palindrome.

EXERCISE 3:(Class, Objects)

- Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method.

EXERCISE 4: (Methods)

- a). Write a JAVA program to implement constructor overloading.
- b). Write a JAVA program implement method overloading.

EXERCISE 5: (Inheritance)

- a). Write a JAVA program to implement Single Inheritance
- b). Write a JAVA program to implement multi level Inheritance
- c). Write a java program for abstract class to find areas of different shapes

EXERCISE 6: (Inheritance - Continued)

- a). Write a JAVA program give example for "super" keyword.
- b). Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?

EXERCISE 7:(Threads & Packages)

- c) . Write a JAVA program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds ,(Repeat the same by implementing Runnable)
- d) Write a Java program to implement packages.

EXERCISE 8: (Exception Handling)

- a).Write a JAVA program that describes exception handling mechanism
- b). Write a JAVA program that implements Runtime polymorphism

EXERCISE 9: (Applet)

- a) Write a JAVA program to display analog clock using Applet.
- b) Write a JAVA program to create different shapes and fill colors using Applet.
- c) Write a Java program to develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.

EXERCISE 10: (Event Handling)

- a) Write a Java program for handling mouse events.
- b) Write a Java program for handling keyboard events.

EXERCISE 11: (Swings)

- a) Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. (Real Time)
- b) Write a JAVA program that to create a single ball bouncing inside a JPanel.

Course Title	Database Management Systems Lab				B.Tech CSE III Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005308	PC (Lab)	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	40	60	100
					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> To give an introduction to systematic database design approaches covering conceptual. Design, logical design and an overview of physical design. To give a good formal foundation on the relational model of data. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	To understand and develop an Entity-Relationship model based on user requirements and Convert to Relational Schema.							
CO 2	Populate and query a database using SQL DML/DDL commands.							
CO 3	Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS.							
CO 4	Programming PL/SQL including stored procedures, stored functions.							

DBMS LAB EXPERIMENTS

1. Draw E-R diagram and convert entities and relationships to relation table for a given scenario.

COLLEGE DATABASE:

STUDENT (Rno, SName, Address, Phone, Gender)

COURSE(CName)

BRANCH(Code,BName)

SEMSEC (Sem, Sec)

SUBJECT (Subcode, Title, Sem, Credits)

IAMARKS (Rno, Subcode, Test1, Test2, Test3, Avg,Rank)

2. Consider University Database and Perform the following:

- a. Viewing all databases
- b. Creating a Database
- c. Viewing all Tables in a Database
- d. Creating Tables (With and Without Constraints)
- e. Inserting/Updating/Deleting Records in a Table
- f. Saving (Commit) and Undoing (rollback)

3. Consider Depttable (DEPTNO, DNAME, LOC) Perform the following:

- a. Rename the table dept as department
- b. Add a new column PINCODE with not null constraints to the existing table DEPT
- c. All constraints and views that reference the column are dropped automatically, along with the column.
- d. Rename the column DNAME to DEPT_NAME in dept table
- e. Change the data type of column loc as CHAR with size 10
- f. Delete table

4. Fo/r a given set of relation schemes, create tables and perform the following:

Simple Queries, Simple Queries with Aggregate functions, Queries with Aggregate functions (group by and having clause), Queries involving- Date Functions, String Functions , Math Functions Join Queries- Inner Join, Outer Join Subqueries- With IN clause, With EXISTS clause.

5. For a given set of relation tables perform the following:

- a. Creating Views (with and without check option), Dropping views, Selecting from a view.

6. Write a PL/SQL program to print integers from 1 to 10 by using PL/SQL FOR loop.

7. Given the table EMPLOYEE (EmpNo, Name, Salary, Designation, DeptID) write a cursor to select the five highest paid employees from the table.

8. Write PL/SQL code for finding specific Employee salary in given table.

9. Illustrate how you can embed PL/SQL in a high-level host language such as C/Java and demonstrates how a banking debit transaction might be done.

10. Given an integer i, write a PL/SQL procedure to insert the tuple (i, 'xxx') into a given relation.

SQL and PL/SQL tutorial: <https://www.w3schools.com/sql/>,
<http://www.plsqltutorial.com/>

Course Title	Exploring Data Analysis with R				B.Tech CSE III Sem (R20)			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
2005309	Skill Oriented Course	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	1	2	2	40	60	100
					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> The course enables the students to apply exploring data analysis with R on real time applications. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understanding the basic concepts of R programming.							
CO 2	Apply critical R programming concepts to handle the data.							
CO 3	Apply statistical concepts on real data.							
CO 4	Use linear regression on given data set.							
CO 5	Apply data visualization using R packages.							

List of Experiments:

1. Download, install R and RStudio on windows.
2. Study of basic syntaxes in R.
 - a. Write a R program to create a sequence of numbers from 20 to 50, find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.
 - b. Write a R program to get the first 10 Fibonacci numbers.
3. Implementation of different types of R operators.
4. Study and implementation of various control structures in R.
 - a. Write a R program to check weather given is even or odd.
 - b. Write a R program to find the sum of n natural numbers $[1+2+3+\dots+n]$.
 - c. Write a R program to get all prime numbers up to a given number.
5. Write a R program to find factorial of a given number using recursive function.
6. Programs using vectors, matrix, factor and list in R.
 - a. Write a R program to create a vector of a specified type and length. Create vector of numeric, complex, logical and character type of length 6.
 - b. Write a R program to create a matrix taking a given vector of numbers as input and define the column and row names. Display the matrix.
 - c. Write a R program to find the levels of factor of a given vector.
 - d. Write a R program to create a list containing strings, numbers, vectors and a logical values.
7. Programs using statics (apply all statistical concepts using R)

8. Programs using linear regression.

Consider the “cars” dataset. Assume “cars\$dist” as the response variable and “cars\$speed” as the predictor variable. Create a model using the `lm()` function.

9. Write a R program to create dataframe and extract specific rows and columns.

10. Study and implementation of data visualization using R packages.

TEXT BOOKS:

1. Seema Acharya - "*Data Analytics Using R*" ,Jan 01, 2018, Seema Acharya-MC GRAW HILL INDIA (2018)
2. Aczel–Sounderpandian: "*Complete Business Statistics*" 7th Edition Complete Business Statistics, Seventh Edition McGraw–Hill Primis.
3. Pierre Lafaye de Micheaux, Remy Drouilhet and Benoit Lique - “ The R Software Fundamentals of Programming and Statistical Analysis”, Springer.

REFERENCE BOOKS:

1. ROBERT I. KABACOFF "R in Action Data analysis and graphics with R" Manning Publications Co 2011

Journals/Magazines

1. Journal of Information Organization (JIO)
2. Open Source for You
3. PC Quest.

SWAYAM/NPTEL/MOOCs:

1. https://onlinecourses.nptel.ac.in/noc21_ma35/preview
2. <https://www.coursera.org/learn/data-analysis-r>