UNIVERSITY OF LUCKNOW

STUDY AND EVALUATION SCHEME
BACHELOR OF COMPUTER APPLICATION

SEMESTER –III

Sl. No.	Paper Code	Subject	Periods			Evaluation Scheme				Sub Total	Credit
						Sessional Exam			Exam. ESE		
			L	T	P	CT	TA	Total			
1	BCA-301	Computer Based Numerical and Statistical Techniques	3	0	0	20	10	30	70	100	3
2	BCA-302	Object Oriented Programming using Java	3	1	0	20	10	30	70	100	4
3	BCA-303	Operating System	3	1	0	20	10	30	70	100	4
4	BCA-304	Management information System	3	0	0	20	10	30	70	100	3
5	BCA-305	Computer Architecture	3	1	0	20	10	30	70	100	4
PRACTICALS											
6	BCA-306P	Computer Based Numerical and Statistical Techniques Lab	0	0	2	10	10	20	30	50	1
7	BCA-307P	Object Oriented Programming & Java Lab	0	0	3	10	10	20	30	50	2
8	BCA-308P	Operating System Lab	0	0	2	10	10	20	30	50	1
9	BCA-GP	General Proficiency	-	-	-	-	-	-	-	50	-
		Total	15	3	7					700	22

Abbreviations:
CT: Class Test
TA: Teacher's Assessment
ESE: End Semester Examination

UNIVERSITY OF LUCKNOW

STUDY AND EVALUATION SCHEME
BACHELOR OF COMPUTER APPLICATION

SEMESTER –IV

Sl. No.	Paper Code	Subject	Periods			Evaluation Scheme				Sub Total	Credit
						Sessional Exam			Exam. ESE		
			L	T	P	CT	TA	Total			
1	BCA-401	Discrete Mathematics	3	1	0	20	10	30	70	100	4
2	BCA-402	Business Economics	3	0	0	20	10	30	70	100	3
3	BCA-403	Computer Graphics and Multimedia systems	3	1	0	20	10	30	70	100	4
4	BCA-404	Data Base Management System	3	1	0	20	10	30	70	100	4
5	BCA-405	Software Engineering	3	0	0	20	10	30	70	100	3
PRACTICALS											
6	BCA-406P	Graphics and Multimedia System Lab	0	0	2	10	10	20	30	50	1
7	BCA-407P	Data Base Management System Lab	0	0	3	10	10	20	30	50	2
8	BCA-408P	Software Engineering Lab	0	0	2	10	10	20	30	50	1
9	BCA-GP	General Proficiency	-	-	-	-	-	-	-	50	-
		Total	**15**	**3**	**7**					**700**	**22**

Abbreviations:
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BCA-301

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

L T P
3 0 0

Unit-I (08)
Error and Computer Arithmetic: Error and their analysis, Normalized Floating point arithmetic.
Algebraic and Transcendental equations: Bisection method, Iteration method, False position method, Newton-Raphson method, Rate of convergence methods, Solutions of simultaneous equations by Gauss Seidel method.

Unit-II (12)
Finite Differences: Difference operators, Difference tables, Relation between operators, Missing term techniques, Factorial polynomials.
Interpolation for Equal Intervals: Newton's forward and backward formula, Gauss forward and backward formula, Stirling's formula, Bessel's formula.
Interpolation for Unequal Intervals: Divided difference, Newton's divided difference formula, Lagrange's Interpolation formula.

Unit-III (10)
Numerical Differentiation and Integration: Numerical differentiation, Numerical integration by Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Boole's rule, Weddle's rule, Euler-Maclaurin's formula.
Solution of Differential Equations: Taylor's series method, Euler's method, Modified Euler's method, Runge-Kutta Method.

Unit-IV (10)
Curve Fitting: Method of least squares, Fitting of straight lines, Second degree parabola.
Time Series and Forecasting: Moving average, Forecasting models and methods.
Testing of Hypothesis: Test of significance, T-test, F-test, Chi-square test, Analysis of Variance.

Text Books:
1. Q.S. Ahmad, Zubair Khan and S.A. Khan, "Numerical and Statistical Techniques", Ane Books Pvt. Ltd., New Delhi.
2. S.S. Sastry, "Introductory Method of Numerical Analysis", PHI, New Delhi.

Reference Books:
1. P. Kandasamy, "Numerical Methods", S. Chand and Company, New Delhi.
2. Balaguruswamy, "Numerical Methods", T.M.H., New Delhi.
3. Qazi Shoeb Ahmad, M. V. Ismail and S.A.Khan, "Business Mathematics and Statistics", Laxmi Publication, Meerut.

BCA-302

OBJECT ORIENTED PROGRAMMING USING JAVA

L T P
3 1 0

Unit-I (10)
Object-Oriented Analysis: Introduction to Object Oriented Concepts, Object Oriented Analysis Modeling, Data Modeling, Origin of Object-Oriented Design, Object Oriented Design Concepts, Object Oriented Design methods, Class and object definition, Refining operations, Program Components and Interfaces, Annotation for Object-Oriented Design, Implementation of Detail Design.

Unit-II (10)
Java Basic : JAVA environment, JAVA program structure, Tokens, Statements, JVM, Constant and Variables, Data Types, Declaration of variables, Scope of variables, Symbolic constants, Type Casting.
Operators: Arithmetic, Relational, Logical assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions and its evaluation.
Object and Class Concept: Defining a Class, Adding variables and Methods to classes, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, and Nesting of Methods.

Unit-III (10)
Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control.
Arrays: One Dimensional and Two Dimensional, Strings, Vectors, Wrapper Classes.
Interface: Defining Interface, Extending Interface, Implementing Interface, Accessing Interface Variable.

Unit-IV (10)
Exception Handling: Concepts of Exceptions, Types of Exception, Try and Catch keyword, Nested Try and Catch.
Threads: Creating Threads, Extending Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization.
Package: System Packages, Using System Package, Adding a Class to a Package, Hiding Classes.

Text Books:

1. E. Balagurusamy, "Programming in Java", TMH Publications.
Reference Books:

1. Peter Norton, "Peter Norton Guide to Java Programming", Techmedia Publications.
2. Naughton, Schildt, "The Complete Reference JAVA 2", TMH.

BCA-303

OPERATING SYSTEM

L T P
3 1 0

Unit-I (10)
Introduction: Definition and types, Structure, Components and Services, System Calls, System Programs.
Process Management: Process Concept, Process Scheduling, Cooperating Processes, Threads, Interprocess Communication, CPU Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling and Algorithm evaluation.

Unit-II (12)
Process Synchronization and Deadlocks: The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Deadlock-System Model, Characterization, Deadlock Prevention, Avoidance and Detection, Recovery from Deadlock, Combined approach to Deadlock Handling.

Unit-III (10)
Memory Management: Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with Paging, Virtual Memory, Demand Paging and its performance, Page Replacement Algorithms, Allocation of Frames, Thrashing, Page Size and other considerations, Demand Segmentation.

Unit-IV (08)
File Management: File Systems, Secondary Storage Structure, File concept, Access methods, Directory implementation, Efficiency and performance, Recovery.
Disk Management: Disk Structure, Disk scheduling, Disk management, Recovery, Swap-Space Management, Disk Reliability.

Text Books
1. Abraham Siberschatz and Peter Galvin "Operating System Concepts", Wiley.
2. Tannenbaum, "Operating System", TMH.
Reference Books
1. Milan Milankovic, "Operating Systems, Concept and Design", McGraw Hill.
2. Harvey M Deital, "Operating System", Addison Wesley.

BCA-304

MANAGEMENT INFORMATION SYSTEM

L T P
3 0 0

Unit-I (12)
Foundation of Information System: Introduction to Information System in Business, Fundamentals of Information System, Solving Business Problems with Information System, Types of Information System, Effectiveness and Efficiency Criteria in Information System.
MIS Overview: Definition and Concept of a Management Information System, MIS versus Data Processing, MIS & Decision Support System, MIS & Information Resources Management, End User Computing, Structure of a Management Information system.

Unit-II (08)
Concepts of Planning and Control: Concept of Organizational Planning, The Planning Process, Computational Support for Planning, Characteristics of Control Process, The Nature of Control in an Organization.

Unit-III (10)
Business Applications of Information Technology: Internet and Electronic Commerce, Intranet, Extranet and Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage.

Unit-IV (10)
Managing Information Technology: Enterprise and Global Management, Security and Ethical Challenges, Planning and Implementing Changes.
Advanced Concepts in Information System: Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management, and Procurement Management.

Text Books:
1. Brian, "Management Information System", Tata Mcgraw-hill Education Pvt. Ltd.
2. Gordon B. Davis & Margrethe H. Olson, "Management Information System", Tata Mcgraw-hill Education Pvt. Ltd.

Reference Books:
1. Brian, "Introduction to Information System", Tata Mcgraw-hill Education Pvt. Ltd.
2. Murdick, "Information System for Modern Management", PHI Learning Private Limited, Delhi India.
3. Jawadekar, "Management Information System", Tata Mcgraw-hill Education Pvt. Ltd.

BCA-305

COMPUTER ARCHITECTURE

L T P
3 1 0

Unit-I (09)
Introduction: Classification of computers and their instruction: general register organization, stack organization, addressing modes. Computer instruction types: formats, instruction cycles & sub-cycles, micro operations and execution of complete instruction. Introduction to RISC and CISC architecture.

Unit-II (09)
Basic Concepts of Parallel Processing: concept of programme, process, threads, concurrent and parallel execution. Classifications of Parallel architecture: Flynn's & Feng's Classification. Basic Pipelining Concepts: Performance metrics & measures and speed up performance laws.

Unit-III (11)
Pipeline Processing: principle of pipelining, general structure of pipelines, classification of pipeline processors, general pipeline and reservation tables. Principle of Designing pipelined Processor: pipeline instruction execution, pre-fetched buffer, internal forwarding and register tagging, hazard detection & resolution. Pipeline Scheduling Theory: scheduling problem, collision vector, state diagram, pipeline scheduling optimization, multiple vector task dispatching.

Unit-IV (11)
Programme Partitioning & Scheduling: grain size & latency, grain packing & scheduling and static multiprocessor scheduling. Programme Flow Mechanism: control flow vs data flow, demand driven mechanism and comparison of flow mechanism. SIMD Interconnection Network: static & dynamic network, mesh connected illiac network, cube interconnection network and omega network.

Text Books:
1. John P Hayes "Computer Architecture and organization" McGraw Hill
2. Dezso Sima,Terence Fountain and Peter Kacsuk " Advanced Computer Architecture" Pearson Education
3. Kai Hwang " Advanced Computer Architecture" TMH

Reference Books:
1. Linda Null, Julia Lobur- The Essentials of Computer Organization and Architecture, 2014, 4th Edition.
2. Rao, P.V.S. Prospective in Computer Architecture" Prentice Hall of India
3. William Stallings "Computer Organization and Architecture" Pearson
4. Carl Hamacher, ZvonkoVranesic and Safwat Zaky, "Computer Organization" Mcgraw Hill Fifth International Edition

BCA-306P

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES LAB

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0 0 2

Note: - At least ten experiments are to be conducted.

1. WAP to find the eigen values and eigenvectors of a given square matrix.

2. WAP to find the root of the Algebraic equations using Bisection Method.

3. WAP to findthe root of the Algebraic equations using Regula - falsi Method.

4. WAP to find the root of the Algebraic equations using Newton Raphson Method.

5. WAP to implement Newton"s Forward Interpolation formula.

6. WAP to implement Newton"s Divided Difference Interpolation formula.

7. WAP to implement Langranges Interpolation formula.

8. WAP to implement Numerical Integration using Trapezoidal rule.

9. WAP to implement Numerical Integration using Simpson 1/3 rule.

10. WAP to implement Numerical Integration using Simpson 3/8 rule.

11. WAP to implement Numerical Differentiations.

BCA-307P

OBJECT ORIENTED PROGRAMMING & JAVA LAB

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0 0 3

Note: - At least ten experiments are to be conducted. Perform practical using JAVA language.

1. Write a program in java which prints your name using command line arguments.

2. Write a program in java which enters three number using command line arguments and print sum and average of the number

3. Write a program to swap the value of 2 variables without using 3rd variable

4. Write a program to calculate the sum of digits of a given integer no.

5. Write a program to compute the sum of the first and last digit of a given number.

6. Write a program in java which enter the number using Data Input Stream and check whether the entered number is even or odd.

7. Write an application that reads a string and determines whether it is a palindrome.

8. Write a program to enter a sentence form keyboard and also find all the words in that sentence with starting character as vowel.

9. Write a Program in java which creates the array of size 5; find the sum and average of the five numbers.

10. Create a java program that has three version of add method which can add two, three, and four integers.

11. Program illustrating Classes and Objects.

12. Program illustrating Method Overloading and Method Overriding.

13. Program illustrating concept of Interface.

14. Program illustrating use of Final and Super keyword.

15. Program that illustrates the Creation of simple package.

16. Program that illustrates the Accessing of a package.

17. Program that illustrates the Handling of predefined exceptions.

18. Program that illustrates the Handling of user defined exceptions.

BCA-308P

OPERATING SYSTEM LAB

L T P
0 0 2

Note: - At least ten experiments are to be conducted. Perform practical using C language.

1. FCFS(First Come First Served)

2. RR(Round Robin) Scheduling

3. SJF(Shortest Job First)

4. Priority Scheduling

5. FIFO(First In First Out) Page Replacement

6. LRU(Least Recent Used) Page Replacement

7. Optimal Page Replacement

8. Banker's Algorithm for Dead Lock Avoidance

9. Sequential File Allocation

10. Indexed File Allocation

11. Linked File Allocation

12. Paging Memory Allocation Technique

BCA-401

DISCRETE MATHEMATICS

L T P
3 1 0

Unit-I (12)
Set Theory: Introduction, Combination of sets, Multisets, Ordered pairs. Proofs of some general identities on sets.
Relation: Relations on sets, Types of relations in a set, Properties of relations, Composition of relations, Representation of relations, Closures of relations.
Function: Types of functions, Composition of functions, Recursively defined function.

Unit-II (08)
Algebraic Structures: Properties, Semi group, Monoid, Group, Abelian group, Properties of group, Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism, Isomorphism and Auto-morphism of groups.

Unit-III (10)
Partial order sets: Definition, Partial order sets, Combination of partial order sets, Hasse diagram.
Lattices: Definition, Properties of lattices – Bounded, Complemented, Modular and Complete lattice. Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra ,Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Boolean algebra.

Unit-IV (10)
Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction ,Algebra of proposition, Theory of Inference. Predicate Logic: First order predicate, well formed formula of predicate, quantifiers, Inference theory of predicate logic.

Text Books:
1. Liptschutz, Seymour, "Discrete Mathematics", TMH.
2. Trembley, J.P and R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", TMH.

Reference Books:
1. C.L.Liu, "Elements of Discrete Mathematics", McGraw Hill.

BCA-402

BUSINESS   ECONOMICS

L T P
3 0 0

Unit-I   (08)
Introduction: Meaning, Nature and Scope; Economic Problem: Scarcity & Choice; Application of Business Economics in Business Decisions; Objectives of Business Firms; Accounting Profit Vs Economics Profit; Optimization Rules: Revenue, Cost and Profit.

Unit-II   (10)
Demand Analysis: Meaning, Basis of Demand, Types of Demand, Law of Demand, Elasticity's of Demand: Price Elasticity, Income Elasticity and Cross Elasticity; Consumer Equilibrium: Indifference Curve, Properties of Indifference Curve; Demand Forecasting Techniques.
Supply Analysis: Meaning, Law of Supply, Elasticity's of Supply.

Unit-III   (12)
Production Analysis: Meaning, Production Function, Law of Production: Short run and Long run.
Cost Analysis: Concept of Cost, Theory of Cost: Short run and Long run; Economies and Diseconomies of Scale. **Pricing Strategy:** Process of Price Determination, Methods of Pricing, Pricing at different stages of PLC.

Unit-IV   (10)
Market Structure Analysis: Meaning, Types of Market Structure, Price and Output Determination under Perfect Competition, Monopolistic Competition, Oligopoly and Monopoly Market.
Macro-Economics Concerns-National Income: Meaning, Measures of National Incomes, Methods of Measuring National Incomes (in brief); Business Cycle: Meaning and Phases of Business Cycle; Inflation: Meaning, Causes and Types; Monetary Policy: Meaning and Instrument of Monetary policy.

Text Books:
1. D.N. Dwivedi. "Managerial Economics", Vikas Publishing House
2. Ahuja H.L., "Business Economics",S.Chand & Co., New Delhi, 2001

Reference Books:
1. Ferfuson P.R., Rothchild, R and Fergusen G.J."Business Economics" Mac-millan, Hampshire, 1993
2. Karl E.Case & Ray C. fair , "Principles of Economics" , Pearson Education , Asia, 2000

BCA-403

COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

L T P
3 1 0

Unit-I **(08)**
Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Hardware and software for Computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Converting Circles, Converting Ellipses.

Unit-II **(10)**
Display Technologies: Raster-Scan Display System, Video Controller, Random-Scan Display Processor, Input Devices for Operator Interaction, Image Scanners, Working Exposure on Graphics Tools like Dream Weaver, 3D Effects.
Clipping: Sutherland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm.

Unit-III **(12)**
Geometrical Transformation: 2D Transformation, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Composition of 2D Transformations, Window-to-Viewport Transformations.
Representing Curves & Surfaces: Polygon Meshes Parametric, Cubic Curves, Quadric Surface, Solid Modeling: Representing Solids, Regularized Boolean Set, Operation Primitive Instancing, Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry, Comparison of Representations.

Unit-IV **(10)**
Introductory Concepts: Multimedia Definition, CD-ROM and the Multimedia Highway, Computer Animation Design, Types of Animation, Different Graphical Functions.
Multimedia: Uses of Multimedia, Making a Multimedia; The Stage of Project, Hardware and Software Requirements to make Good Multimedia, Skills and Training Opportunities in Multimedia, Motivation for Multimedia Usage.

Text Books:
1. Foley, Van Dam, Feiner, Hughes, "Computer Graphics Principles& Practice".
2. Tay Vaughan, "Multimedia, Making IT Work", Osborne McGraw Hill.
3. Buford, "Multimedia Systems", Addison Wesley.

Reference Books:
1. Sleinreitz, "Multimedia System", Addison Wesley.
2. David Hillman, "Multimedia technology and Applications", Galgotia Publications.
3. D.J. Gibbs & D.C. Tsichritzs, "Multimedia programming Object Environment& Frame work", LNCS Tutorial.
4. D. Haran & Baker, "Computer Graphics", Prentice Hall of India.

BCA-404

DATA BASE MANAGEMENT SYSTEM

L T P
3 1 0

Unit-I (08)
Introduction to Databases: Advantage of Database System, Database System versus File System, View of Data, Database System Concepts and Architecture: Data Models, Schemas and Instances, Three schema architecture and Data Independence, Database Languages and Interfaces, Classification of Database Management Systems.

Unit-II (10)
Entity-Relationship Model: Basic Concepts, Constraints, Keys: Primary Key, Super key, Candidate key, Entity Types, Entity Sets, Design issues, Entity-Relationship Diagram, Relations, Relationship types, Roles and Structural Constraints, Weak Entity sets, Extended ER Features, Design of E-R Database Schema, Reduction of an E-R Schema to tables.

Unit-III (12)
Relational Model and Constraints: Relational model Concepts, Structure of Relational Databases, Constraints: Entity integrity, Referential Integrity, Domain Constraints, Assertions, Triggers, Security and Authorization, Authentication and Encryption.
SQL: Data Definition, Constraints, Schema Changes in SQL, Basic Queries in SQL, More Complex SQL Queries, Insert, Delete and Update Statements in SQL, Views (in SQL).

Unit-IV (10)
The Relational Algebra: Tuple Relational Calculus, Data Normalization: Functional dependencies, Normal form concepts upto 3rd Normal form.
Transaction Management and Recovery Techniques: Introduction to Transaction Processing, Transaction Concepts and Properties, Schedules, Serializability of Schedules, Conflict and view serializable schedules, Recovery Concepts, Recovery from Transactions, Introduction to Concurrency Control Techniques.

Text Books
1. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley.
2. Silberschatz, Korth, Sudarshan , "Database System Concepts", McGrawHill.

Reference Books
1. Date C J, "An Introduction to Database System", Addision Wesley
2. Leon & Leon, "Database Management System", Vikas Publishing House
3. Bipin C. Desai, "An Introduction to Database Systems", Galgotia Publications
4. Majumdar & Bhattacharya, "Database Management System", TMH
5. Ramkrishnan, Gehrke, "database Management System", McGraw Hill

BCA-405

SOFTWARE ENGINEERING

L T P
3 0 0

Unit-I **(10)**
Software Product and SDLC: Software Engineering Fundamentals, Definition of Software Products, Phases of Software Development Life Cycle, Software Development Paradigm, Software Life Cycles Models: Build and Fix Model, Waterfall Model, Prototype Model, Iterative Model, Evolutionary Model, Spiral Model.

Unit-II **(10)**
Software Requirement Specification (SRS): Need for SRS-Requirement process, Problem Analysis using UML (Unified Modelling Language) and Data dictionary, Characteristics of SRS, Components of an SRS. IEEE standard for SRS.

Unit-III **(10)**
Software Design Principles: Software Design, Design Process, Design Principles: Abstraction, Refinement, Modularity, Information Hiding, Modular Design: Effective Modular Design and Functional Independence, Cohesion, Coupling, Top down and Bottom up Strategies, Coding: Coding Standard and Guidelines, Testing: Black Box Testing and White Box Testing.

Unit-IV **(10)**
CASE Tools: Relevance of CASE Tool**,** Building block for CASE Tools, Integrated Case Tool Environment, Generation of CASE Tool, High End and Low End CASE Tools.
Project Management Fundamentals: Definition of Project, Project Specification and Parameters, COCOMO model, Principles of Project Management, Project Management Life Cycle, Program Management Plan: Concept, Elements, Planning Issues, Benefits of Program Management.

Text Books:
1. Rajib Mall, "Fundamental of Software Engineering", PHI.

Reference Books:
1. R. Pressman, "Software Engineering", TMH.
2. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa.
3. Pankaj Jalote, "Software Project Management in Practice", Person Education.

BCA-406P

GRAPHICS AND MULTIMEDIA SYSTEM LAB

L T P
0 0 2

Note: - At least ten experiments are to be conducted.

1. Write a program for 2D line drawing using DDA algorithm.

2. Write a program to draw a line using Bresenham's Algo.

3. Write a program for circle drawing as Raster Graphics Display.

4. Write a program to draw a circle using Midpoint algorithm.

5. Write a program to rotate a point about origin.

6. Write a program to rotate a triangle about origin.

7. Write a program to scale the triangle.

8. Write a program to translate the triangle.

9. Write a program to reflect the triangle.

10. Write a program for line clipping.

11. Write a program for polygon clipping.

12. Write a Program to implement 2D-transforrnation.

13. Introduction to Flash 5.0 creating a small animation using Flash 5.0.

DATA BASE MANAGEMENT SYSTEM LAB

L T P
0 0 3

Part I: Getting familiar with SQL (Maximum number of turns allotted: 3)

1) Creating tables.

2) Insertion, Deletion, Updation and Retrieval of data.

3) Arithmetic operations, Logical operations and Pattern matching.

4) Concept of Grouping (Group by clause, Having Clause).

5) Use Aggregate function in query.

6) Write commands for Joins, Union and Intersection.

7) Concept of Sub-query.

8) Concept of Data constraints (Unique Key, Primary Key, Foreign Key).

9) Creating Views and Indexes.

Part II: Relational Database Implementation

Implement the following mini-project's database schemas and give an expression in SQL for each of the queries.

Project 1. Library Management System:

Create the following schema, enter at least 5 records in each table and answer the queries given below.

LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price**)**

IssuedBooks (Accession number, Borrower**)**

a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.

b) Delete the record of book titled "Database System Concepts".

c) Change the Department of the book titled "Discrete Mathematics" to "CSE".

d) List all books that belong to "CSE" department.

e) List all books that belong to "CSE" department and are written by author "Navathe".

f) List all computer (Department="CSE") that have been issued.

g) List all books which have a price less than 500 or purchased between "01/01/2015" and "01/01/2019".

Project 2. Student Management System:

Create the following schema, enter at least 5 records in each table and answer the queries given below.

> **Student** (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)
>
> Paper Details (Paper code, Name of the Paper)
>
> **Academic_details** (College roll number, Paper code, Attendance, Marks in home examination)
>
> **a)** Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
>
> **b)** Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.
>
> **c)** List all students who live in "Lucknow" and have marks greater than 60 in paper 1.
>
> **d)** Find the total attendance and total marks obtained by each student.
>
> **e)** List the name of student who has got the highest marks in paper 2.

Project 3. Customer Management System:

Create the following schema, enter at least 5 records in each table and answer the queries given below.

> **Customer** (CustID, email, Name, Phone, ReferrerID)
>
> **Bicycle** (BicycleID, DatePurchased, Color, CustID, ModelNo)
>
> **BicycleModel** (ModelNo, Manufacturer, Style)
>
> **Service** (StartDate, BicycleID, EndDate)
>
> **a)** Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
>
> **b)** List all the customers who have the bicycles manufactured by manufacturer "Honda".
>
> **c)** List the bicycles purchased by the customers who have been referred by customer "C1".
>
> **d)** List the manufacturer of red colored bicycles.
>
> **e)** List the models of the bicycles given for service.

Project 4. Human Resource Management System:

Create the following tables, enter at least 5 records in each table and answer the queries given below.

> **EMPLOYEE** (Person_Name, Street, City)
>
> **WORKS** (Person_Name, Company_Name, Salary)
>
> **COMPANY** (Company_Name, City)
>
> **MANAGES** (Person_Name, Manager_Name)

a) Identify primary and foreign keys.

b) Alter table employee, add a column "email" of type varchar(20).

c) Find the name of all managers who work for both Samba Bank and NCB Bank.

d) Find the names, street address and cities of residence and salary of all employees who work for "Samba Bank" and earn more than $10,000.

e) Find the names of all employees who live in the same city as the company for which they work.

f) Find the highest salary, lowest salary and average salary paid by each company.

g) Find the sum of salary and number of employees in each company.

h) Find the name of the company that pays highest salary.

Project 5. Supplier Management System:

Create the following tables, enter at least 5 records in each table and answer the queries given below.

Suppliers (SNo, Sname, Status, SCity)

Parts (PNo, Pname, Colour, Weight, City)

Project (JNo, Jname, Jcity)

Shipment (Sno, Pno, Jno, Qunatity)

a) Identify primary and foreign keys.

b) Get supplier numbers for suppliers in Paris with status>20.

c) Get suppliers names for suppliers who do not supply part P2.

d) For each shipment get full shipment details, including total shipment weights.

e) Get all the shipments where the quantity is in the range 300 to 750 inclusive.

f) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.

g) Get the names of cities that store more than five red parts.

h) Get full details of parts supplied by a supplier in Delhi.

BCA-408P

SOFTWARE ENGINEERING LAB

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Note: - At least 6 mini-projects are to be implemented from Part II.

Part I – To Familiarize with CASE tools using ATM system as specification. (Maximum number of turns allotted: 3)

1. Introduction and project definition
2. Software process overview
3. Project planning
4. Software requirements
5. Introduction to UML and use case diagrams
6. System modeling (DFD and ER)
7. Flow of events and activity diagram
8. OO analysis: discovering classes
9. Interaction diagrams: sequence and collaboration diagrams
10. Software Design: software architecture and object-oriented design
11. State Transition Diagram
12. Component and deployment diagrams
13. Software testing
14. Presentations.

Part II- Design a mini-project using CASE tools

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for given different case studies for each batch. UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.

7. Component Diagram

8. Deployment Diagram.

Projects:

1. Patient Appointment and Prescription Management System

2. Organized Retail Shopping Management Software

3. Online Hotel Reservation Service System

4. Examination and Result computation system

5. Automatic Internal Assessment System

6. Parking Allocation System

7. Wholesale Management System

8. Criminal Record Management : Implement a criminal record management system for jailers, police officers and CBI officers

9. DTC Route Information: Online information about the bus routes and their frequency and fares

10. Car Pooling: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.