

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Design & Analysis of Algorithms	Course Code: B109411(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

COURSE OBJECTIVES :

1. Apply Mathematical concepts and notations to define a problem
2. Apply the divide-conquer and Greedy methods to solve a problem
3. Ability to solve real life problems with these algorithmic techniques
4. Familiarize the concept of multidisciplinary functions
5. Interpret data using NP problems and applications of various algorithms to solve real life problems

UNIT-I: INTRODUCTION TO ALGORITHM DESIGN

Fundamentals of algorithms, Asymptotic notations: big oh, small oh, omega and theta notations, worst case, best case and average case analysis. solving recurrence equations: General recurrence equation, Master Method, Recursive Tree Method, substitution method, analysing control structures. Analysis of Sorting and Searching: Heap, insertion, selection and bubble sort; sequential, binary and Fibonacci search.

UNIT-II: DIVIDE AND CONQUER AND GREEDY METHOD

DIVIDE AND CONQUER: Introduction, Binary Search, Merge sort and its algorithm analysis, Quick sort and its algorithm analysis, Strassen's Matrix multiplication.

GREEDY METHOD: The basic greedy strategy & computing minimum spanning trees, Algorithms of Kruskal and Prims, Dijkstra Algorithm, use of greedy strategy in algorithms for the Knapsack problem and Huffman tree Algorithm.

UNIT-III: DYNAMIC PROGRAMMING

The basic dynamic programming paradigm, Dynamic programming solution to the optimal matrix chain multiplication, longest common subsequence (LCS) problem, Flyod-Warshall Algorithm, Bellmanford Algorithm, 0/1 Knapsack Problem, Travelling Salesman Problem, Multi stage graph, Optimal Binary Search Trees.

UNIT-IV: BACKTRACKING

Introduction - NXN Queen's Problem, Sum of Subsets, Graph Coloring, Hamiltonian's Circuit, Travelling Salesman Problem, Generating Permutation.

UNIT-V: BRANCH BOUND & RANDOMIZED ALGORITHM

Branch and Bound & NP Complete Problem: General method, applications: Travelling sales person problem, 0/1 knapsack problem, LC (Least-cost search), FIFO Branch and Bound solution. NP-Hard and NPComplete problems: Basic concepts, non-deterministic algorithms, NP – Hard and NP-Complete classes, Cook's theorem.

Text Books:

1. Cormen, Lelerson, Rivert, "Introduction to Algorithms", Second Edition, PHI.
2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Galgotia Publications Pvt. Ltd., 2008

Reference Books:

1. Paneerselvam, "Design and Analysis of Algorithms", Prentice-Hall of India, 2006
2. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Pearson Education, 2005.
3. Gilles Brassard and Paul Bratley, "Fundamentals of Algorithms", Prentice-Hall of India, 1997

Course Outcomes: [The students should be able to]:

1. Calculate the Time complexity of Insertion sort, Heap sort, Bubble sort, Linear and Binary search algorithms.
2. Apply the algorithms and design techniques to solve problems related to divide and conquer and Greedy Algorithm
3. Analyse Dynamic programming problems including Matrix chain multiplication, Longest Common subsequence and Knapsack Problem.
4. Understand the implementation of Backtracking and Recursive Backtracking Methods.
5. Understand the basic concepts of NP-Hard, NP-Complete and Branch and Bound methods.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Database Management Systems	Course Code: B109412(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

COURSE OBJECTIVES :

1. To understand the role of a database management system and its users in an organization.
2. To understand database concepts, including the structure and operation of the relational data model
3. Can successfully apply logical database design principles, including E-R diagrams and database normalization.
4. Construct simple and moderately advanced database queries using Structured Query Language (SQL).
5. To understand the concept of transaction, its properties and how to persist the data in complex concurrent users' environment.

UNIT-I: Introduction to Database & Indexing Techniques: Advantages of DBMS, Type of Data Models, Schema and instances, DBMS Architecture and Data Independence. Entity- Relationship Model: Attributes and Keys, Relationship Types, Weak Entity set, Strong Entity Set, Enhanced E-R Modeling, Specialization and Generalization. **Indexing Techniques:** Indexes, Multi-level indexes, Dynamics Multilevel indexes using B trees and B+- Trees.

UNIT-II: The Relational Data Model & SQL: Types of data models, Relational data model: concepts, constraints, relational algebra, relational calculus, Tuple and Domain relational calculus, **SQL:** DDL, DML, DCL, Types of constraints, defining different constraints on a table, Defining & Dropping integrity constraints in the alter table command, View, Index.

UNIT-III: Database Design: Functional Dependencies and Normalization for Relational Databases: Informal design guidelines for relation schemes, Functional dependencies, Normal forms based on primary keys, General definitions of second and third normal forms, Boyce- Codd normal form, problem related with normal forms & solutions. Multi valued & Join Dependencies, 4th & 5th Normalization.

UNIT-IV: Query & Transaction Processing: Query Processing: Query processing stages, Query interpretation, Query execution plan, Table scans, Fill factor, Multiple index access, Methods for join tables scans, Structure of a query optimizer. **Transaction Processing:** Types of failures, ACID property, schedules and recoverability, satiability of schedules, Levels of transaction consistency, Deadlocks.

UNIT-V: Crash recovery and Concurrency Control: Failure classification, Different type of Recovery techniques & their comparative analysis, deferred update, immediate update, Shadow paging, Check points, On-line backup during database updates. Concurrency Control: Different type of concurrency control techniques & their comparative analysis, Locking techniques, Time- stamp ordering, multi-version techniques, Optimistic techniques, Multiple granularities. **Database Security:** Authentication, Authorization and Access Control, DAC, MAC, RBAC models, Intrusion detection, SQL injection.

Text Books:

1. Korte & Sudarshan, Database system concept, MH.
2. Ullman, J. O, Principles of Database Systems, Golgotha Publications.
3. C.J. Date, Introduction to Database Systems, Pearson Education.

Reference Books:

1. J. D. Ullman, Principles of Database and Knowledge – Base Systems], Vol 1, Computer Science Press
2. Serge Abiteboul, Richard Hull, Victor Vianu, Foundations of Databases, Addison-Wesley

Course Outcomes: [The students should be able to]:

1. Be familiar with basic concepts of RDBMS, Relational data model & be able to write relational algebra expressions for queries;
2. Be familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B-tree and hashing;
3. Understand DML, DDL and will be able to construct queries using SQL by knowing the importance of data & its requirements in any applications;
4. Utilize a database modeling technique for a single entity class, a one-to-one (1:1) relationship between entity classes, a one-to-many (1:M) relationship between entity classes, a many-to-many (M:M) relationship between entity classes, and recursive relationships;
5. Be familiar with the basic issues of transaction, its processing and concurrency control.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: AI&ML
Subject: Object-Oriented Programming (with Java)	Course Code: B109413(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

COURSE OBJECTIVES :

1. To construct Java programs using features of Object oriented programming.
2. Able to explain object and package construction process.
3. To construct robust Java programs using exception handling and String class.
4. To develop java programs using multithreading and File Handling
5. To design and develop application programs using UI components and Database connectivity.

UNIT-I: Introduction: Introduction & Fundamentals of JAVA, basic concepts of object-oriented programming, About Java Technology, comparison between procedural programming paradigm and object-oriented programming paradigm, Java's architecture, Fundamental Programming Structure: Data Types, variable, Arrays. Control Flow: Java's Selection statements (if, switch, iteration, statement, while, do-while, for, Nested loop), Concept of Objects and Classes, Reading console inputs, Constructor overloading, final, this, static keyword. (C++ VS JAVA)

UNIT-II: Inheritance: definition and advantages, super keyword, Method overriding, dynamic method dispatch, Abstract class, Inner classes, Interface. Aggregation, Method overriding. Package: Package, importing packages, sub package. Exception Handling: Fundamentals, Inbuilt, User defined, Checked and Unchecked exceptions, Using try & catch, Multiple catch, throw, throws, finally.

UNIT-III: String class: Strings: string constructor, string methods, StringBuffer and methods. Wrapper classes (Integer, Boolean, Character, etc.). Multi-threading: Thread concept, Thread life cycle, Thread class, Runnable interface, synchronization, Thread class methods. Java I/O: Use of InputStream, OutputStream, Reader and Writer classes for reading from and writing data into disk files.

UNIT-IV: Applets: Basics, Architecture, The HTML APPLET Tag, Passing Parameters to Applets, Applet context and show documents (). Event Handling: Delegation Event model, Event Classes, Event Listener, Interfaces, Adapter classes. JDBC: Fundamentals, Type I, Type II, Type III, Type IV drivers. Networking: Basics, Socket overview, Networking classes, & interfaces, TCP/IP client sockets, URL format, URL connection, TCP/IP Server Sockets.

UNIT-V: AWT: components, Button, Label, TextField, Panel, Window, Frame, Canvas, ActionListener, MouseListener, KeyListener, ItemListener etc. Layout managers, Remote method invocation(RMI). SWING: JButton, JLabel, JTextField, JScrollBar, JComboBox, JTabbedPane, JScrollPane, JTree etc. Generics in Java: Creating instances of generic classes, generic types, Declaring (and invoking) methods that take generic types. Creating and running executable JAR (Java Archives).

Text Books:

1. Java - The Complete Reference, Herbert Schildt, 11th Edition, McGraw Hill Education
2. Programming with Java, Balagurusamy, 6th Edition, McGraw Hill Education
3. Object Oriented Programming through JAVA, V. Vijaya Bhaskar , P. VenkataSubba Reddy, 1st Edition, SCITECH

Reference Books:

1. Java: A Beginner's Guide, Herbert Schildt, 8th Edition, McGraw-Hill Education.
2. Core Java: An Integrated Approach R. Nageswara Rao, 8th Edition, Dream Tech Press.

Course Outcome:

At the end of the course students will be able to:

1. Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP like encapsulation, Inheritance and Polymorphism
2. Design and develop java programs, analyze, and interpret object oriented data and report results.
3. Design an object oriented system, AWT components and multithreaded processes as per needs and specifications.
4. Creating your own windows application and you can able to know how to utilize the various available resources without need of other's help.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Computer System Architecture	Course Code: B109414(022)
Total / Minimum-Pass Marks(End Semester Exam): 100 / 35	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

Course Objectives:

1. Identify the basic structure of computers.
2. Familiarize themselves with computer arithmetic.
3. Understand various parts of a system memory hierarchy.
4. Understand design of modern processors, memories and I/O.
5. Get knowledge of parallel, pipelined, superscalar and RISC/CISC architectures.

UNIT- I: Basic Structure Of Computers: Functional units, Basic operational concepts, Bus structures Addressing modes, subroutines: parameter passing, Instruction formats, BASIC PROCESSING UNIT: bus architecture, Instruction Cycle, sequencing of control signals, Hardwired control, Micro programmed Control, microinstruction format.

UNIT- II: Arithmetic: Number representations and their operations, Design of Fast Adders, Signed multiplication, Booth's Algorithm, bit-pair recoding, Integer Division, Floating point numbers and operations, guard bits and rounding.

UNIT-III: The Memory System: Various technologies used in memory design, Memory Hierarchy: Main Memory, Auxiliary Memory, Associative Memory, Cache memory, Virtual Memory. Memory Management Hardware, Multi-module memories and Interleaving.

UNIT-IV: Input/ Output Organization: Peripheral Devices, I/O interfaces I/O-mapped I/O and memory-mapped I/O, interrupts and interrupt handling mechanisms, vectored interrupts, synchronous vs. asynchronous data transfer, Direct Memory Access.

UNIT-V: Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Text Books:

1. Computer System Architecture, M. Marris Mano, PHI.
2. Computer Organization, V.C.Hamacher, Z.G.Vranesic and S.G.Zaky., McGraw Hill.

Reference Books:

1. Computer Organization & Architecture, W. Stallings, Pearson Education India.
2. Structured Computer Organization, A.S.Tanenbaum. Pearson.

Course Outcomes [After undergoing the course, students will be able to:]

1. Identify the basic hardware components of a computer system and represent system design in appropriate formats; addressing modes, an instruction sets as per the system configuration requirements.
2. Familiarize themselves with binary and hexadecimal number systems including computer arithmetic.
3. Outline organization of various parts of a system memory hierarchy.
4. Demonstrate computer architecture concepts related to design of modern processors, memories and I/O.
5. Basics functionality of systems: parallel, pipelined, superscalar and RISC/CISC architectures.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Discrete Structure	Course Code: B109415(022)
Total / Minimum-Pass Marks(End Semester Exam): 100 / 35	L: 2 T: 0 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

Course Objectives:

1. To introduce a number of discrete mathematical structures found to be serving as tools in the development of theoretical computer science.
2. Course focuses on how discrete structures actually helped computer engineers to solve problems occurred in the development of programming languages.
3. Course highlights the importance of discrete structures towards simulation of a problem in computer science engineering.

UNIT-I: MATHEMATICAL LOGIC & BOOLEAN ALGEBRA: Basic concept of mathematical logic, Statements, Connectives, Conditional and biconditional statements, Logical equivalence, Logical implication & quantifiers, Basic concept of Boolean Algebra, Properties of Boolean Algebra, Boolean functions, Disjunctive & conjunctive normal forms of Boolean functions, Applications of Boolean Algebra in switching circuits & logic circuits.

UNIT-II: SET THEORY, RELATIONS, FUNCTIONS: Basic concept of set theory, Relations, Properties of relation in a set, Equivalence relation, Composition of relations, Partial order & total order relations, Lattices & Hasse diagram, Introduction to function, Inverse, Identity, Injective, Surjective & Bijective functions, Composition of functions and some special functions.

UNIT-III: ALGEBRAIC STRUCTURES: Groups, Subgroups, Cosets, Lagrange's theorem, Isomorphism, Automorphism, Homomorphism, Codes & group codes, Rings, Integral domains and Fields.

UNIT-IV: GRAPH THEORY: Introduction to graph theory, Walks, Paths & Circuits, Types of graphs, Shortest path problems, Eulerian and Hamiltonian graphs, Basic concept of tree: spanning tree, minimum spanning tree, search tree, rooted binary tree, Cut sets, Network flow, Matrix representation of graphs.

UNIT-V: COMBINATORICS: Permutation and combination, Pigeon-hole principle, Mathematical induction, Principle of Inclusion and Exclusion, Generating function, Recurrence relation.

Text Books:

1. Elements of discrete mathematics by C.L. Liu, Tata McGraw-Hill, publications.
2. Discrete Mathematical structures, by Bernard Kolman, Robert C. Busby and Sharon Cutler Ross, Pearson Education.

Reference Books:

1. A Text Book of Discrete Mathematics, Swapan Kumar Sarkar, S. Chand & Company Ltd.
2. Graph theory with applications to engineering and computer science, by Narsingh Deo, Prentice Hall of India.
3. Discrete mathematics for computer scientists and mathematicians, by J.L. Mott, A. Kandel and T.P. Baker, Prentice Hall of India.
4. Discrete Mathematical Structures with applications to computer science, by J.P. Tremblay and R. Manohar, Tata McGraw-Hill.

Course Outcomes:

After completion of this course students will be –

1. Able to apply mathematical logic and Boolean algebra in switching circuits & logic circuits.
2. Familiar with set theory, relation and functions.
3. Familiar with algebraic structures, graph theory and combinatorics.
4. Able to solve problems in various fields in computer science, specially networking

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Design & Analysis of Algorithms Using Python Laboratory	Course Code: B109421(022)
Total / Minimum-Pass Marks (End Semester Exam): 40/20	L: 0 T: 0 P: 2 Credits: 1

Course Objectives:

1. The principle objective of this course is to build solid foundation in algorithms and their applications.
2. To implement various divide and conquer techniques examples.
3. To implement various Greedy techniques examples.
4. To implement various Dynamic Programming techniques examples.
5. To provide a practical exposure of all algorithms.
6. To understand the importance of algorithm and its complexities.

Suggested List of Experiments (but should not be limited to):

1. Write a program to perform operation count for a given pseudo code
2. Write a program to perform Bubble sort for any given list of numbers.
3. Write a program to perform Insertion sort for any given list of numbers.
4. Write a program to perform Quick Sort for the given list of integer values.
5. Write a program to find Maximum and Minimum of the given set of integer values.
6. Write a Program to perform Merge Sort on the given two lists of integer values.
7. Write a Program to perform Binary Search for a given set of integer values recursively and non- recursively.
8. Write a program to find solution for knapsack problem using greedy method.
9. Write a program to find minimum cost spanning tree using Prim's Algorithm.
10. Write a program to find minimum cost spanning tree using Kruskal's Algorithm.
11. Write a program to perform Single source shortest path problem for a given graph.
12. Write a program to find solution for job sequencing with deadlines problem.
13. Write a program for all pairs shortest path problem.
14. Write a program to solve N-QUEENS problem.
15. Write a program to solve Sum of subsets problem for a given set of distinct numbers.

References:

1. Data Structures and Algorithms by G.A.V. Pai, 2017, TMH.
2. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.

Course Outcomes [After undergoing the course, students will be able to:]

1. Students will be able to calculate the time complexity of algorithm.
2. Students will be able to sort the given numbers using various sorting algorithms.
3. Students will be able to write programs for the problems using Divide and Conquer.
4. Students will be able to write programs for the problems using Greedy Method.
5. Students will be able to write programs for the problems using Dynamic programming.
6. Students will be able to write programs for the problems using Backtracking.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Database Management Systems Laboratory	Course Code: B109422(022)
Total / Minimum-Pass Marks (End Semester Exam): 40/20	L: 0 T: 0 P: 2 Credits: 1

Course Objectives:

1. To explain basic database concepts, applications, data models, schemas and instances.
2. To demonstrate the use of constraints and relational algebra operations. Describe the basics of SQL and construct queries using SQL.
3. To emphasize the importance of normalization in databases.
4. To facilitate students in Database design

Suggested List of Experiments (but should not be limited to):

1. Database Schema for a customer-sale scenario Customer (Cust id: integer, Cust name: string) Item (item_id: integer, item name: string, price: integer) Sale (bill no: integer, bill date: date, custoid: integer, item_id: integer, qty_sold: integer) For the above schema, perform the following— Create the tables with the appropriate integrity constraints Insert around 10 records in each of the tables
 - (a) List all the bills for the current date with the customer names and item numbers.
 - (b) List the total Bill details with the quantity sold, price of the item and the final amount.
 - (c) List the details of the customer who have bought a product which has a price>200.
 - (d) Give a count of how many products have been bought by each customer.
 - (e) Give a list of products bought by a customer having cust_id as 5.
 - (f) List the item details which are sold as of today.
 - (g) Create a view which lists out the bill no, bill date, cust_id, item_id, price, qty_sold, amount.
 - (h) Create a view which lists the daily sales date wise for the last one week.
 - (i) Create a view which lists out the bill no, bill date, cust_id, item_id, price, qty_sold, amount.
 - (j) Create a view which lists the daily sales date wise for the last one week.
2. Database Schema for a Student Library scenario Student (Stud no: integer, Stud name: string) Membership (Mem_no: integer, Stud no: integer) Book(book no: integer, book_name:string, author: string) Iss_rec (iss_no: integer, iss_date: date, Mem_no: integer, book_no: integer) For the above schema, perform the following—
 - (a) Create the tables with the appropriate integrity constraints.
 - (b) Insert around 10 records in each of the tables.
 - (c) List all the student names with their membership numbers.
 - (d) List all the issues for the current date with student and Book names.
 - (e) List the details of students who borrowed book whose author is CJ DATE.
 - (f) Give a count of how many books have been bought by each student.
 - (g) Give a list of books taken by student with stud_no as 5.
 - (h) List the book details which are issued as of today.
 - (i) Create a view which lists out the iss_no, iss _date, stud_name, book name.
 - (j) Create a view which lists the daily issues-date wise for the last one week.
3. Database Schema for a Employee-pay scenario employee (emp_id: integer, emp_name: string) department (dept_id: integer, emp_name: string) pay details (emp_id: integer, dept_id: integer, basic: integer, deductions: integer, additions: integer, DOJ: date) payroll (emp_id: integer, pay_date: date)

For the above schema, perform the following:

- (a) Create the tables with the appropriate integrity constraints
 - (b) Insert around 10 records in each of the tables
 - (c) List the employee details department wise
 - (d) List all the employee names who joined after particular date
 - (e) List the details of employees whose basic salary is between 10,000 and 20,000
 - (f) Give a count of how many employees are working in each department
 - (g) Give a name of the employees whose net salary > 10,000
 - (h) List the details for an employee_id=5
 - (i) Create a view which lists out the emp_name, department, basic, deductions, net salary
 - (j) Create a view which lists the emp_name and his netsalary
4. Database Schema for a student-Lab scenario Student (stud_no: integer, stud_name: string, class: string) Class (class: string, descrip: string) Lab (mach_no: integer, Lab_no: integer, description: String) Allotment (Stud_no: Integer, mach_no: integer, dayof week: string) For the above schema, perform the following—
- (a) Create the tables with the appropriate integrity constraints
 - (b) Insert around 10 records in each of the tables
 - (c) List all the machine allotments with the student names, lab and machine numbers
 - (d) List the total number of lab allotments day wise
 - (e) Give a count of how many machines have been allocated to the MCSIT 'class
 - (f) Give a machine allotment detail of the stud_no 5 with his personal and class details
 - (g) Count for how many machines have been allocated in Lab_no 1 for the day of the week as Monday
 - (h) How many students class wise have allocated machines in the labs?
 - (i) Create a view which lists out the stud_no, stud_name, mach_no, lab_no, dayofweek
 - (j) Create a view which lists the machine allotment details for Thursday
5. (a) Write and execute subprogram to find largest number from the given three numbers.
(b) Write and execute subprogram using loop, while and for iterative control statement.
6. (a) Write and execute subprogram to check whether the given number is Armstrong or not
(b) Write and execute subprogram to generate all prime numbers below 100.
7. (a) Write and execute subprogram to demonstrate the GOTO statement.
(b) Write a subprogram to demonstrate %type and %rowtype attributes
8. (a) Write and execute subprogram to demonstrate predefined exceptions
(b) Write and execute subprogram to demonstrate user defined exceptions
9. (a) Create a cursor, which displays all employee numbers and names from the EMP table.
(b) Create a cursor, which update the salaries of all employees as per the given data.
10. (a) Create a cursor, which displays names of employees having salary > 50000.
(b) Create a procedure to find reverse of a given number
11. (a) Create a procedure to update the salaries of all employees as per the given data
(b) Create a procedure to demonstrate IN, OUT and INOUT parameters
12. (a) Create a function to check whether given string is palindrome or not.
(b) Create a function to find sum of salaries of all employees working in depart number 10.
13. Create a trigger before/after update on employee table for each row/statement.
14. Create a trigger before/after delete on employee table for each row/statement.
15. Create a trigger before/after insert on employee table for each row/statement.
16. (a) Create a Form to display employee details using SQL
(b) Create a Report to generate all employee annual salaries....

Additional Programs:

1. Create a Master/details relationship form which perform Add New, Search, Delete, Save and Update on the records
2. Generate a report to calculate employee 's salaries department wise from employee table.
3. Create a Report to generate the details of employee table including sum and average salaries department wise.

References:

1. Elma Sri Nava the, Fundamentals of Database Systems, Pearson Education
2. C.J. Date, A. Kannan, S. Swami Nadhan, An Introduction to Database systems, Pearson, Eight Edition

Course Outcomes [After undergoing the course, students will be able to:]

1. Apply the basic concepts of Database Systems and Applications.
2. Use the basics of SQL and construct queries using SQL in database creation and interaction.
3. Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
4. Analyze and Select storage and recovery techniques of database system.
5. To familiarize issues of concurrency control and transaction management.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Object-Oriented Programming Laboratory (with Java)	Course Code: B109423(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credits: 1

Course Objectives:

1. To develop java programs using constructors and destructors.
2. To utilize the concept of inheritance to develop java programs.
3. To demonstrate the use of exception handling and Strings in java programs.
4. To create multithreaded applications using java programming.
5. To design and develop interactive application programs using user Interfacing components, file handling etc.

List Of Experiments:

1. Write a program to find the volume of a box having its side w,h,d means width ,height and depth. Its volume is $v=w*h*d$ and also find the surface area given by the formula $s=2(wh+hd+dw)$. use appropriate constructors for the above.
2. Develop a program to illustrate a copy constructor so that a string may be duplicated into another variable either by assignment or copying.
3. Create a base class called shape. Apart from Constructors, It contains two methods get xy564value() and show xyvalue() for accepting co-ordinates and to display the same. Create the sub class Called Rectangle which contains a method to display the length and breadth of the rectangle called showxyvalue().Illustrate the concepts of Overriding and Constructor call sequence.
4. Write a program that creates an abstract class called dimension, create two subclasses, rectangle and triangle. Include appropriate methods for both the subclass that calculate and display the area of the rectangle and triangle.
5. 5. Write a program, which throws Arithmetic Exception. Write another class (in a different file) that handles the Exception.
6. Create a user defined Exception class which throws Exception when the user inputs the marks greater than 100 Catch it and again rethrow it.
7. Write a program to illustrate various String class methods.
8. Write a program to illustrate various String Buffer methods.
9. Write a program in which a Mythread class is created by extending the Thread class. In another class, create objects of the Mythread class and run them. In the run method print "CSVTU" 10 times. Identify each thread by setting the name.
10. Write a program to illustrate various Thread methods.
11. Write a Program to implement Bank Account Class which illustrates the concept of Thread Synchronization.
12. To write a program to create a text file using Byte Stream class.
13. To write a program to copy contents of one file to another.
14. Write a program to find numbers of occurrence of vowels in a file.
15. Write a program, which illustrates capturing of Mouse Events. Use Applet for this.
16. Write a program using swing components which simulates simple calculator.
17. Write a JDBC program for Student Mark List Processing.

Course Outcomes

At the end of the course students will be able to:

1. Understand and apply object oriented features and C++ concepts
2. Apply the concept of polymorphism and inheritance.
3. Implement exception handling and templates.
4. Develop network and window application using awt and swings.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Virtual Lab – PHP/MySQL	Course Code: B109424(022)
Total / Minimum-Pass Marks (End Semester Exam): 40/20	L: 0 T: 0 P: 2 Credits: 1

Course Objectives: The main objective of this course is to introduce the concept of PHP and give basic knowledge of PHP. The students will learn about PHP Syntax. Controls and Loops, PHP and MySQL connectivity, PHP form validation, PHP form handling.

Suggested List of Experiments (but should not be limited to):

1. Install and configure PHP, any web server, MySQL.
2. Introduction and working of server side program execution.
3. Implement control and looping structures using PHP.
4. Develop application using user defined and built in functions.
5. Develop application to use regular expressions, handle exceptions, and validate data.
6. Design web pages using text box, radio buttons, check box, buttons.
7. Design web pages using list box, combo box, and hidden field box.
8. Develop web pages with form data validation.
9. Develop simple application for sending and receiving plain text message.
10. Develop web based application to enter data in database and retrieve data from data base.
11. Develop web based application to update, delete data from database.
12. Develop application for session tracking and cookies.
13. Testing and solution for SQL Injection, code injection etc.

Books:

1. Lynn Beighley and Michael Morrison, Head First PHP & MySQL, O'Reilly Media.
2. JulieC.Meloni, PHP, MySQLandApache,SAMSTeachyourself,Pearson Education.
3. McGrath, Mike, PHP and MySQL, McGraw Hill.
4. Holzner, Steven, The Complete Reference PHP, McGraw Hill.
5. Rasmus Lerdorf, Kevin T and Peter M, Programming PHP, O'Reilly.

Course Outcomes [After undergoing the course, students will be able to:]

1. Configure web server, MySQL, PHP.
2. Code PHP based application.
3. Design dynamic web pages.
4. Apply modern tools and techniques for data validation.
5. Develop web based application using PHP and MySQL

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (IV Sem)	Branch: Data Sciences
Subject: Indian Culture and Constitution of India	Course Code: B000406(046)
Total Internal Assessment: 10	L: 0 T: 0 P: 2 Credits: 0

Course Objectives:

The course aims to impart the ability to understand, connect up and explain basics of Indian traditional knowledge in modern scientific perspective and to introduce students to the Constitution of India.

UNIT – I: Introduction to Indian Ethics: Indian Culture; Civilization; Heritage; General characteristics and major literature; Vedic visions and Upanishads

UNIT – II: Modern Science and Indian Knowledge System: Development of Science and Technology in ancient, medieval and modern India; Eminent Scientists; Yoga and Holistic health care

UNIT – III: Introduction: Historical Perspective of Constitution of India; Philosophy of Indian Constitution; Meaning of the constitution law and constitutionalism; Salient features and Preamble.

UNIT – IV: Contours of Constitutional Rights and Duties: Fundamental rights; Scheme of the Fundamental Duties and its legal status.

UNIT – V: Organs of Governance: Parliamentary Form of Government in India; The constitutional powers and status of the President of India; Judiciary- Powers and Functions; Local Self Government – Constitutional Scheme in India.

Reference Books:

1. Text and Interpretation: The India Tradition, Kapil Kapoor, D K Printworld.
2. Modern Physics and Vedant, Swami Jitatmanand, Bharatiya Vidya Bhavan
3. Essentials of Indian Philosophy, M Hiriyanna, Motilal Banarsidass
4. Introduction to the Constitution of India, Basu D D, Lexis Nexis
5. Principles of Public Administration, Dr S N Myneni, Allahabad Law Agency

Course Outcomes: [The students should be able to]:

1. Demonstrate awareness about philosophy of Indian culture and scriptures
2. Exhibit understanding about Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care.
3. Display understanding about the history and philosophy of Indian Constitution.
4. Demonstrate clarity about the premises informing the twin themes of liberty and freedom from civil rights perspective.
5. Display understanding about powers and functions of Indian government.