

2304CS302 - Object Oriented Programming using Java
Semester - 3 (BCA/BSCIT)

No.	Course Content	Planning Title	Planning Description
1	Revision of C	Implimentation of Basic C Programs, Control Structure and Loop	1. Calculate average of three numbers. (A) 2. Find area of circle. (pie*r*r). (A) 3. Calculate simple interest. (principal*roi*time period)/100. (A) 4. WAP to find factorial of the given number. (B) 5. WAP to display all the prime numbers between the given 2 numbers. (C)
2	Revision of C	Demonstrate the use of functions and arrays using following C Programs.	1. WAP to generate Fibonacci series of N given number using method. (A) 2. WAP that calculates area of circle, triangle and square using methods. (B) 3. WAP to count number of even or odd number from an array of n number. (B) 4. WAP to create following patterns. (C) <div style="margin-left: 40px;"> i. * ii. 54321 ** 5432 *** 543 ** 54 * 5 </div>
3	Introduction to Basic Java Programming	Demonstration of basics of java programming	1. Introduction to JDK (Java development kit) and path setting. (A) 2. WAP to print "Welcome to Java". (A) 3. WAP to print your address i) using single print ii) using multiple println. (A) 4. WAP to print addition of 2 number using command line (WITH Integer.parseInt()) (B) 5. Three sides of a triangle are entered through the keyboard. WAP to check whether the triangle is isosceles, equilateral, scalene or right-angled triangle. (C)
4	Introduction to Basic Java Programming	Demonstration of basics of java programming	1. WAP to print addition of 3 numbers (with Scanner). (A) 2. WAP to find a diameter from given area of circle. (A) 3. WAP to convert temperature from Fahrenheit to Celsius. (B) 4. Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a program that prompts the user to enter a weight in pounds and height in inches and displays the BMI. Note: - 1 pound=.45359237 Kg and 1 inch=.0254 meters (C)
5	Introduction to Basic Java Programming	Demonstration of basics of java programming	1. Write a program in java to swap 2 values taken from user with the use of 3rd variable. (A) 2. Write a program in java to find area and perimeter of a sqare and rectangle. (A) 3. Write a program in java to swap 2 values taken from user without using 3rd variable. (B) 4. Write a program to find compound interest. All the necessary input will be given by the user. $CI = P(1 + (r/100))^n - P$ (C)
6	Introduction to Basic Java Programming	Demonstration of basics of java programming	1. WAP that reads a number in meters, converts it to feet, and displays the result. (A) 2. Perform Addition, Subtraction, Multiplication and Division of 2 numbers as per user's choice. (A) 3. WAP to read marks of five subjects calculate total and percentage. (A) 4. Convert seconds into hours, minutes & seconds and print in HH:MM:SS. [e.g. 10000 seconds = 02:46:40] (B)

7	Control Structure, Function and Array	Implementation of Control Structure (Part - I)	<p>1. WAP to check whether the given number is positive or negative. (A)</p> <p>2. Modify program number 2 of Lab number 6. Calculate grade of a student depending on percentage. (If >90% then A+ grade, 80-90% then A grade, 70-80% then B+ grade, 60-70% then B grade, 50-60% then C grade, 35-50% then P grade and <35 then FT) (A)</p> <p>3. Convert number of days into year, week & days. [e.g. 375 days = 1 year, 1 week and 3 days] (C)</p> <p>4. WAP that prompts the user to enter a letter and check whether a letter is a vowel or consonants. (B)</p> <p>5. WAP to find out largest number from given three numbers without using Logical Operator.(C)</p>
8	Control Structure, Function and Array	Implementation of Control Structure (Part - II)	<p>1. WAP to make a Simple Calculator using switch...case. (A)</p> <p>2. WAP that prompts the user to input number of calls and calculate the monthly telephone bills as per the following rule: (B)</p> <p>Minimum Rs. 200 for up to 100 calls. Plus Rs. 0.60 per call for next 50 calls. Plus Rs. 0.50 per call for next 50 calls. Plus Rs. 0.40 per call for any call beyond 200 calls.</p> <p>3. Find Sum of Digits of a Number. (C)</p>
9	Control Structure, Function and Array	Implementation of Control Structure (Part - III)	<p>1. WAP to print numbers between two given numbers which is divisible by 2 but not divisible by 3. (A)</p> <p>2. WAP to find factorial of the given number. (A)</p> <p>3. WAP to find whether the given number is prime or not without using function. (B)</p> <p>4. WAP to print given number in reverse order. (C)</p>
10	Control Structure, Function and Array	Demonstration of types of pattern using loop	<p>WAP to print following pattern using java.</p> <pre> @ * 5 1 *** ** ***** ## ** aa 2 3 ** ** * * @@@ * * * 543 4 5 6 * * * * ##### * * * * bbbb 7 8 9 10 ** ** * * @@@@@@@ * * * * * 54321 ***** ***** (A) (A) (B) (B) (C) (C) </pre>
11	Control Structure, Function and Array	Demonstration of Function (Part-I)	<p>1. WAP to calculate simple interest using method. (A)</p> <p>2. WAP to find maximum number from given three numbers using method. (A)</p> <p>3. WAP that calculates area of circle, triangle and square using method overloading. (A)</p> <p>3. WAP to generate Fibonacci series of N given number using method. (B)</p> <p>4. Write a method with following method header: public int gcd (int num1, int num2). Write a program that prompts the user to enter two integers and compute the gcd of two integers. [Note: The greatest common divisor (GCD) of two numbers is the largest number that divides them both.] (B)</p> <p>4. WAP to accept a number and check whether the number is prime or not. Use method name check (int n). The method returns 1, if the number is prime otherwise, it returns 0. (C)</p> <p>5. WAP to find the factorial of given number using recursion. (C)</p>
12	Control Structure, Function and Array	Implementation of single dimensional array	<p>1. WAP that create an array, take the size of array from the user, take the array member from the user and display it using loop. (A)</p> <p>2. WAP to count number of even or odd number from an array of n number. (A)</p> <p>3. WAP to accept n numbers in an array. Display the sum of all the numbers which are divisible by either 3 or 5. (B)</p> <p>4. WAP to accept n numbers in an array. Now, enter a number and search whether the number is present or not in the list of array elements by using linear search. (C)</p>

13	Control Structure, Function and Array	Implementation of multi dimensional array	<p>1. WAP to read values in two-dimensional array and print them in matrix form. (A)</p> <p>2. WAP to print the score card of cricket match using the two dimensional array. Take all the input regarding score card from the user. (B)</p> <p>3. WAP to read two matrices of size n X n, perform multiplication operation and store result in third matrix and print it. (C)</p> <p>4. WAP to store numbers in 4 X 4 matrix in a two-dimensional array. Find the sum of the numbers of each row and the sum of numbers of each column of the matrix.(C)</p>
14	Control Structure, Function and Array	Implementation of Arrays using Functions	<p>1. WAP to find maximum and minimum number from an array. (A)</p> <p>2. WAP to convert a 2-d array into transpose array. (A)</p> <p>3. WAP to display upper half and lower half of a triangle. (B)</p> <p>4. WAP to calculate unique numbers in an array. (A)</p> <p>5. WAP to remove duplicate values from an array. (C)</p> <p>6. WAP to merge two arrays. (C)</p>
15	Object Oriented Programming	Implementation of built in function of string and stringbuffer class	<p>1. WAP to demonstrate the builtin function of String class (e.g. length(), charAt(), concat(), indexOf(), equals(), valueOf(), toString(), trim(), substring()) (A)</p> <p>2. Java String Program to Print even length words. (B)</p> <p>3. Java String Program to Insert a string into another string. (B)</p> <p>4. Java String program to check whether a string is a Palindrome (C)</p> <p>5. Java String Program to Set Characters to a String and get that character from that string. (C)</p>
16	Object Oriented Programming	Demonstration of functionalities of math class	<p>1. WAP to demonstrate the builtin function of Math class (e.g. min(), max(), random(), pow(), sqrt(), round(), ceil(), floor(), abs()) (A)</p> <p>2. WAP to print the largest number from the three given number using Math class function. (B)</p> <p>3. WAP to check that whether the given number is Armstrong or not using Math class function. (C)</p>
17	Object Oriented Programming	Demonstration of the object and class (Part-I)	<p>1. Create a class named Candidate with Candidate_ID, Candidate_Name, Candidate_Age, Candidate_Weight and Candidate_Height data members. Also create a method GetCandidateDetails() and DisplayCandidateDetails(). Create main method to demonstrate the Candidate class. (A)</p> <p>2. Create a class named Bank_Account with Account_No, User_Name, Email, Account_Type and Account_Balance data members. Also create a method GetAccountDetails() and DisplayAccountDetails(). Create main method to demonstrate the Bank_Account class. (A)</p>
18	Object Oriented Programming	Demonstration of the object and class (Part-II)	<p>1. WAP with following specifications: (A) Class Name: Employee Data Members: Employee_ID, Employee_Name, Designation, Age, Salary Member Functions: GetEmployeeDetails () and DisplayEmployeeDetails ().</p> <p>2. Define Time class with hour and minute as data member. Also define addition method to add two-time objects. (B)</p>
19	Object Oriented Programming	Demonstration of the object and class (Part-III)	<p>1. WAP to create Circle class with area and perimeter function to find area and perimeter of circle. (A)</p> <p>2. Create a class which ask the user to enter a sentence, and it should display count of each vowel type in the sentence. The program should continue till user enters a word "quit". Display the total count of each vowel for all sentences. (B)</p>

20	Object Oriented Programming	Demonstration of the object and class (Part-IV)	<p>1. Write a class program with following specifications: (A) Class Name: Student Data Members: Enrollment_No, Student_Name, Semester, CPI and SPI Member Functions: GetStudentDetails () and DisplayStudentDetails ().</p> <p>2. Define class for Complex number with real and imaginary part. Describe its constructor, overload the constructors and instantiate its object. Also define addition method to add two Complex objects. (B)</p>
21	Object Oriented Programming	Demonstration of functionalities of Nested Class, Inner class, Wrapper class	<p>1. WAP to demonstrate concept of nested class. (A) 2. WAP to demonstrate anonymous inner class. (B) 3. WAP to demonstrate concepts of autoboxing and unboxing using wrapper class. (C)</p>
22	Inheritance and Abstraction	Implementation of this and static keyword	<p>1. Write a program in Java to demonstrate use of this keyword. (A) 2. Check whether this can access the Static variables of the class or not.(A) 3. Write a java program static block which will be executed before main () method in a class. Also demonstrate the static method. (B) 4. Create a class "Rectangle" that would contain length and width as an instance variable and count as a static variable. Define constructors [constructor overloading (default, parameterized and copy)] to initialize variables of objects. Define methods to find area and to display variables' value of objects which are created. [Note: define initializer block, static initializer block and the static variable and method. Also demonstrate the sequence of execution of initializer block and static initialize block] (C)</p>
23	Inheritance and Abstraction	Implementation of types of inheritance	<p>1. WAP to demonstrate single inheritance, multilevel inheritance and hierarchical inheritance. (A) 2. Create a class named shape. In this class, we have three subclasses circle, triangle and square. WAP to display area of all three classes. (B) 3. WAP for implementing single inheritance which creates one class account_details for getting account information and another class interest for calculating and displaying total interest from the data inserted from account details. (C)</p>
24	Inheritance and Abstraction	Implementation of function overriding, super and final keywords	<p>1. Demonstrate the Method overriding using example. (A) 2. Demonstrate the use of Super Keyword to access constructor, function and variable of immediate parent class from the subclass . (A) 3. Demonstrate the use of Final Keyword to prevent function overriding, variable modification and extraction of a class in sub class. (B) 4. Create a class named 'Member' having the following members: (C) 1 - Name 2 - Age 3 - Phone number 4 - Address 5 – Salary It also has a method named 'printSalary' which prints the salary of the members. Two classes 'Employee' and 'Manager' inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'specialization' and 'department' respectively. Now, assign name, age, phone number, address and salary to an employee and a manager by making an object of both of these classes and print the same along with specialization and department respectively.</p>

25	Inheritance and Abstraction	Implementation of advanced concept of inheritance	<p>1. Design a class named MyPoint to represent a point with x- and y-coordinates. The class contains: The data fields x and y that represent the coordinates with getter methods. (A)</p> <ul style="list-style-type: none"> -> a no-arg constructor that creates a point (0, 0). -> a constructor that constructs a point with specified coordinates. -> a method named distance that returns the distance from this point to a specified point of the MyPoint type. -> a method named distance that returns the distance from this point to another point with specified x- and y-coordinates. <p>2. Create a class named ThreeDPoint to model a point in a three-dimensional space. Let ThreeDPoint be derived from MyPoint with following additional features: (B)</p> <ul style="list-style-type: none"> -> A data fields named z that represents the z-coordinate. A no-arg constructor that creates a point (0, 0, 0). -> A constructor that constructs a point with three specified coordinates. -> A get method that returns the z value. -> Override the distance method to return the distance between two points in the three-dimensional space. <p>3. Write a program that creates two points (0, 0, 0) and (10, 30, 25.5) and display the distance between the two points. (C)</p>
26	Inheritance and Abstraction	Implementation of the use of abstract class and interface	<p>1. The abstract Vegetable class has three subclasses named Potato, Brinjal and Tomato. Write a program that demonstrates how to establish this class hierarchy. Declare one instance variable of type String that indicates the color of a vegetable. Create and display instances of these objects. Override the toString() method of object to return a string with the name of vegetable and its color. (A)</p> <p>2. Create interface EventListener with performEvent() method. Create MouseListener interface which inherits EventListener along with mouseClicked(), mousePressed(), mouseReleased(), mouseMoved(), mouseDragged() methods. Also create KeyListener interface which inherits EventListener along with keyPressed(), keyReleased() methods. WAP to create EventDemo class which implements MouseListener and KeyListener and demonstrate all the methods of the interfaces. (A)</p> <p>3. Implement the structure of multiple inheritance using class and interface in java. (B)</p> <p>4. The Transport interface declares a deliver () method. The abstract class Animal is the super class of the Tiger, Camel, Deer and Donkey classes. The Transport interface is implemented by the Camel and Donkey classes. Write a test program that initialize an array of four Animal objects. If the object implements the Transport interface, the deliver () method is invoked. (B)</p> <p>5. Implement the structure of hybrid inheritance using class and interface in java. (C)</p> <p>6. Declare a class called book having author_name as private data member. Extend book class to have two sub classes called book_publication & paper_publication. Each of these classes have private member called title. Write a program to show usage of dynamic method dispatch (dynamic polymorphism) to display book or paper publications of given author. Use command line arguments for inputting data. (C)</p>

27	Package , Exception Handling and IO Programming	Demonstration of the types of access specifiers	<p>1. WAP to demonstrate the use of private, public, protected and default access modifiers using two package. (A)</p> <p>2. Assume that there are two packages, student and exam. A student package contains Student class and the exam package contains Result class. Write a program that generates mark sheet for students. (B)</p> <p>3. Define a class A in package apack. In class A, three variables are defined of access modifiers protected, private and public. Define class B in package bpack which extends A and write display method which accesses variables of class A. Define class C in package cpack which has one method display() in that create one object of class A and display its variables. Define class ProtectedDemo in package dpack in which write main () method. Create objects of class B and C and class display method for both these objects. (C)</p>
28	Package , Exception Handling and IO Programming	Implementation of exception handling mechanism	<p>1. Demonstrate the built-in types of exception using example. (A)</p> <p>2. Demonstrate the customize exception using throw keyword with example. (A)</p> <p>3. WAP to accept N integer numbers from the command line. Raise and handle exceptions for following cases : (B)</p> <ul style="list-style-type: none"> - when a number is –ve - when a number is evenly divisible by 10 - when a number is greater than 1000 and less than 2000 - when a number is greater than 7000 <p>Skip the number if an exception is raised for it, otherwise add it to find total sum.</p> <p>4. WAP to create Account class, which is representing a bank account where we can deposit and withdraw money. if we want to withdraw money which exceed our bank balance? We will not be allowed, create a customize exception to handle above situation and display proper error message. (C)</p>
29	Package , Exception Handling and IO Programming	Implementation of File, FileReader and FileWriter class using java	<p>1. Write a java program to create a file to the specified location. (Use File Class) (A)</p> <p>2. WAP to copy the content of one file to another file and console. (Use FileReader and File Writer Class) (A)</p> <p>3. WAP to demonstrate FileInputStream and FileOutputStream class. (A)</p> <p>4. WAP to Merge the content of two files into single file. (B)</p> <p>5. WAP to demonstrate BufferedReader and BufferedWriter class. (B)</p> <p>6. WAP to Copy the content of one file into multiple file. (C)</p> <p>7. WAP to demonstrate BufferedInputStream and BufferdOutputStream class. (C)</p>
30	Package , Exception Handling and IO Programming	Implementation of File, FileReader and FileWriter class using java	<p>1. Write a program that counts number of characters, words, and lines in a file. Use exceptions to check whether the file that is read exists or not. (A)</p> <p>2. Write a program to replace all “word1” by “word2” from a file1, and output is written to file2 file and display the no. of replacement. (A)</p> <p>3. Write an application that reads a file and counts the number of occurrences of digit 5. Supply the file name as a commandline argument. (B)</p> <p>4. Create a class called Student. Write a student manager program to manipulate the student information from files by using FileInputStream and FileOutputStream. (C)</p>