

**Guidelines of
Programming in Java (BACS05A)
Discipline Specific Elective - (DSE-I)**

Unit	Topics	Chapters (as per pdf version)	Reference
I	<i>Introduction to Java programming:</i> Java development environment, Java program structure	Ch-1 pg 50 (Only History), 54 (Only Creation of java), 62-65 (Java buzzwords)	[1]
		Ch-2 complete	
II	<i>Java Programming Constructs:</i> Data types, variables, constants, scope and life time of variables, operators, expressions, type conversion and casting, control flow, conditional statements, loops, break and continue statements, arrays, command line arguments, methods.	Ch-3 pg 101-131	[1]
		Ch-4 complete	
		Ch-5 complete	
III	<i>Classes and Objects:</i> Class, object, constructor, destructor, parameter passing, static fields and methods, access control, this reference, overloading of methods and constructors, garbage collection, accessibility modifiers.	Ch-6 complete	[1]
		Ch-7 pg 244-256, 261-271, 279-280 (Only command line arguments)	
IV	<i>OOPS concepts:</i> Encapsulation, inheritance, polymorphism, dynamic binding, dynamic method dispatch, method overriding, final classes and methods, abstract classes and methods	Ch-8 pg 292-331	[1]

REFERENCES

[1] Schildt, H. (2019). Java The Complete reference (11th Edition). Tata Mc Graw Hill.

Practical List

1. Write a java program to add, subtract, multiply and divide any two numbers entered by the user.
2. Write a java program to compute the square, cube of a number entered by a user using methods.
3. Write a java program to demonstrate the use of :
 - a. Bitwise operators.
 - b. Shift operators.
4. Write a java program to compute maximum of three numbers:
 - a. Using ternary operator.
 - b. Using if-else statement.

5. Write a menu driven program (using switch-case) which accepts a number as user input :
 - a. Checks whether the number is even or odd
 - b. Checks whether the number is prime
6. Write a menu driven program (using switch-case) which accepts a number as user input:
 - a. Prints sum of digits of the given number
 - b. Prints reverse of the given number
7. Write a program to display the first n terms of a Fibonacci series.
8. Write a method to compute the factorial of a number. Use this method to compute the sum of the series: $1 + x/1! + x^2/2! + x^3/3! + \dots + x^n/n!$
9. Write a java program that accepts a list of elements from the user in an array. Calculate the sum and average of the numbers entered. Accept the size of the array as command line argument.
10. Write a java program that accepts a list of elements from the user in an array and displays the elements in the ascending order.
11. Write a java program to create a class "Student" having:
 - a. Data members: RollNo, Name, Course
 - b. Methods: getData()-To retrieve values of data members, displayData()-To display values of data members
12. Write a java program to create a class "Room" having:
 - a. Data members: Length, Breadth, Height as dimensions of the room
 - b. Three constructors:
 - i. Having no parameter -that accepts values of data members from the user.
 - ii. Having one parameter –which specifies the same value of all dimensions.
 - iii. Having three parameters-which passes different values of all dimensions.
13. Write a java program to create a class "Student" having:
 - a. Private Data members: RollNo, Name, Marks1, Marks2, Marks3
 - b. Constructor: -To assign values to data members
 - c. Methods: - i. CalculatePercentage()-To calculate percentage of marks
 - ii. CalculateDivision()- calculates division based on formula:
 - a) Ist Div if percentage is >60
 - b) IInd Div if percentage is between 50 and 60
 - c) IIIrd Div if percentage is <50
 - iii. displayMarksheet()-To display values of data members as well as percentage and division of student
14. Write a java program that calculates the area of circle, rectangle and triangle using method overloading.
15. Create a class Employee containing information about employees of same organization. It should have following data members:
 - a. EmpId (Private),
 - b. CompanyName(static and final),
 - c. No-of-employees (static)




It should have a static method to calculate no. of employees in the organisation based on the number of objects of employees created and a display() method to display Number of employees in that organization.

16. Create a Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two subclasses Teacher and Student. Maintain the respective information in the classes and create and display objects of these two classes using Runtime Polymorphism.

17. Create a Circle class having data member radius. Create a subclass of circle called Cylinder having data members: radius and height. Both classes should have a method called area() that calculates their area.

18. Create an abstract class called shape having abstract method area() and two variables dimension1 and dimension2. Create two subclasses of shape, rectangle and triangle class which implement the method area().