

19IT201 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

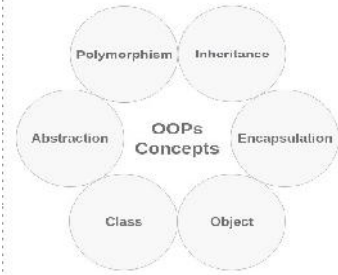
Hours Per Week :

L	T	P	C
3	-	4	5

Total Hours :

L	T	P
45	-	60

WA/RA	SSH/HSH	CS	SA	S	BS
5	30	5	20	5	5



SOURCE:

<https://>

[cdncontribute.](https://cdncontribute.geeksforgeeks.org/wp-content/uploads)

[geeksforgeeks.](https://cdncontribute.geeksforgeeks.org/wp-content/uploads)

[org wp-content/](https://cdncontribute.geeksforgeeks.org/wp-content/uploads)

[uploads](https://cdncontribute.geeksforgeeks.org/wp-content/uploads)

[OOPs Concepts.jpg](https://cdncontribute.geeksforgeeks.org/wp-content/uploads)

PRE REQUISITE COURSES: Programming for Problem Solving, Data Structures

COURSE DESCRIPTION AND OBJECTIVES:

This course deals with the fundamentals of Object Oriented Programming (OOP) Concepts and OOP based software development methodology. Java as a class-based and pure OOP language is used to demonstrate and implement appropriate concepts and techniques. The students are exposed to the concepts, fundamental syntax, and the thought processes behind object oriented programming. By the end of course, students will acquire the basic knowledge and skills necessary to implement object oriented programming techniques through Java in software development.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Define, understand, differentiate the Object Oriented concepts and Java Programming concepts.	1
2	Apply Object Oriented concepts on real time scenarios.	2
3	Use Exception handling and Multithreading mechanisms to create efficient software applications.	3
4	Utilize modern tools and collection framework to create Java applications to solve real world problems.	5
5	Design and develop GUI based applications using applets and swings for internet and system based applications.	4

SKILLS:

- ✓ Analyze and develop algorithms for real life problems using Java.
- ✓ Experience with developing and debugging programs in different IDEs.
- ✓ Develop Multithreaded applications.
- ✓ Create web applications.

UNIT- I**L- 9**

INTRODUCTION: History of Java, Byte code, JVM, Java buzzwords, OOP Principles, Data types, Variables, Scope and life time of variables, Operators, Control statements, Type conversion and casting, Arrays.

Concepts of classes and objects, Introducing methods, Method overloading, Constructors, Constructor overloading, Usage of static with data and methods, Access control, This key word, Garbage collection, String class.

UNIT – II**L- 9**

INHERITANCE, PACKAGES AND INTERFACES : Inheritance basics, Types of inheritance, Member access rules, Usage of super key word, Method overriding, Usage of final, Abstract classes, Defining an interface, Differences between abstract classes and interfaces, Implementing interface, Applying interfaces, Variables in interface and extending interfaces; Defining, creating and accessing a Package, Importing packages, Access control in packages.

UNIT – III**L- 9**

EXCEPTION HANDLING&MULTITHREADING: Concepts of exception handling, Types of exceptions, Usage of Try, Catch, Throw, Throws and Finally Keywords, Built-in exceptions, Creating user defined exception; Concepts of multithreading, Differences between process and thread, Thread life cycle, Creating multiple threads using thread class and runnable interface, Synchronization, Thread priorities, Inter thread communication.

UNIT – IV**L- 9**

COLLECTION FRAMEWORK : Collections overview, Collection interfaces - list, set, collection classes - array list, linked list, hash set, treeset, accessing a collection via an iterator, The legacy classes and interfaces- Dictionary, Hashtable, StringTokenizer.

UNIT - V**L-9**

GUI PROGRAMMING WITH SWING: Applet Class, Applet skeleton, Simple Applet; The Delegation event model - Events, Event sources, Event Listeners; Event classes, Handling mouse and keyboard events.

Exploring Swing Controls- JLabel and Image Icon, JTextField, JButton, JCheckBox, JRadioButton, JTabbed Pane, JList, JCombo Box.

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS

TOTAL HOURS: 60

Exercise-1

BASIC PROGRAMS :

- a. Write a Java program to print "Welcome".
- b. Write a java program to read the different types of data from the user and display that data using Scanner class.
- c. Write a java program to read the different types of data from the user and display that data using command line arguments.
- d. Write a Java program to illustrate type conversions.
- e. Write a java program to observe the effects of various bitwise operators.

Exercise-2

DECISION MAKING STATEMENTS:

- a. Write a Java program to find the largest number out of 3 numbers using nested if.
- b. Raju's parents are celebrating their marriage anniversary. They have arranged a small party tonight. They are expecting their colleagues and Raju's friends to attend the party. They have planned to serve 'Coke' and 'Badam Milk' to these guests. But they would like to serve 'Badam Milk' to teenagers and 'Coke' to adults. Please help them in finding teenagers and adults based on age. Write a Java program to find out the adults and teenagers based on their age.

Note: Teenagers are those whose age is between 13 and 19 (both inclusive).

Step by Step guide

Read the age as input from the user

Check the age with the conditions mentioned

Display the appropriate messages (Eg: Adult or Teenager) and also a message regarding the drink (Eg: Badam Milk or Coke)

- c. There is a telecommunication company called "PoweredAir" who have approached you to build their Interactive Voice Response (IVR) system. You should write a Java program and be able to provide the following menu (given below):

Note: User should provide an input for each menu display. Welcome to Powered Air Service. What would you like to do?

Know my balance

Know my validity date

Know number of free calls available

More

Prepaid Bill Request

Customer Preferences

GPRS activation

Special Message Offers

Special GPRS Offers

3G Activation

Go back to Previous menu

If user types in 7 the first menu should be displayed. You are free to display your own messages in this IVR

Exercise-3

LOOPING STATEMENTS:

- Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
- Write a java program to find the sum of even numbers upto 100.
- Write a java program to print the following output.

```

1
2 3
4 5 6
7 8 9 10

```

- Write a program in Java to print the Floyd's Triangle.

```

1
01
101
0101
10101

```

- Write a Java program to print Fibonacci series using for loop.
- Write a Java program to check whether given number is Armstrong or not using while loop.

Exercise-4

ARRAYS:

- Write a Java program to read 10 numbers from user and store it in a array. Display the maximum and minimum number in the array.
- Write a java program to sort the given list of elements in an array.
- Write a Java program to search a given element in the array.
- Write a Java program to calculate multiplication of 2 matrices.

Exercise-5

STRINGS:

- Write a java program to check whether given string is palindrome or not.
- Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (use StringTokenizer class)
- Write a Java program for sorting a given list of names in ascending order.
- Write a Java program that displays the number of characters, lines and words in a text file.

Exercise-6

CLASS, OBJECTS AND METHODS:

- a. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.

Hint: Area of rectangle = length * width
Perimeter of rectangle = 2*(length+width)

- b. Design a class "Company" which has as attributes yearOfEstablishment, annualTurnover, annualSales, etc., Moreover, these details need to be available to the outside world. Have appropriate methods for displaying these details. You will also need to calculate the profitability of this company (if annualTurnover/annualSales > 1 then profitability is high; <0.5 then profitability is low; between 0.5 and 1 then profitability is medium).
- c. Write a java program that implements method overloading.

Exercise-7**INHERITANCE, POLYMORHISM AND INTERFACES:**

- a. Write a java program to implement various types of inheritance.
 - i. Single
 - ii. Multi-Level
 - iii. Hierarchical
 - iv. Hybrid
- b. Create an abstract class Media (id, description). Derive classes Book (pagecount) and CD (playtime). Define parameterized constructors. Create one object of Book and CD each and display the details.
- c. Write a java program to implement runtime polymorphism
- d. Define an interface, operations which has method area(), volume(). Define a constant PI having value 3.14. Create class a Cylinder which implements this interface (member-id, height). Create one object and calculate area and volume.

Exercise-8**PACKAGES:**

Write a java program to implement the following

- a. Creation of simple package
- b. Accessing a package

Exercise-9**EXCEPTION HANDLING:**

- a. Write a java program which accepts withdraw amount from the user and throws an exception "In Sufficient Funds" when withdraw amount more than available amount.
- b. Write a java program to illustrate finally block.

Exercise-10**THREADS:**

- a. Write a java program to create three threads and that displays "good morning", for every one second,"hello" for every 2 seconds and "welcome" for every 3 seconds by using extending Thread class.
- b. Write a Java program that creates three threads. First thread displays "OOPS", the second thread displays "Through" and the third thread Displays "JAVA" by using Runnable interface.

Exercise -11

COLLECTIONS:

- a. Write a Java program to create a new array list, add some colors (string) and print out the collection
- b. Write a Java program to shuffle elements in a array list
- c. Write a Java program to iterate through all elements in a linked list
- d. Write a Java program to iterate through all elements in a hash list
- e. Write a Java program to create a new tree set, add some colors (string) and print out the tree set

Exercise-12

EVENT HANDLING:

- a. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
- b. Implement a Java program for handling key events when the key board is pressed, released, typed.

Exercise-13

APPLETS AND SWINGS:

- a. Develop an Applet program to accept two numbers from user and output the sum, difference in the respective text boxes.
- b. Write a java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button "add" is pressed.
- c. Write a JAVA program to design student registration form using Swing Controls. The form which having the following fields and button SAVE

Form Fields are: Name, RNO, Mailid, Gender, Branch ,Address

TEXT BOOK:

1. Herbert Schildt, "Java The Complete Reference", 9th edition, McGraw Hill Education (India) Pvt. Ltd., 2014.

REFERENCE BOOKS:

1. P. Radha Krishna, "Object Oriented Programming Through Java", 1st edition, Universities Press, 2007.
2. R. A. Johnson, "Java Programming and Object Oriented Application Development", 1st edition, Cengage Learning, 2006.