# PARUL UNIVERSITY - Faculty of IT & Computer Science

**Department of Computer Application**

**SYLLABUS FOR 4th Sem B.Sc. (IT), BCA, IMCA, IMCA (A.Y.-IV) PROGRAMME**

**Core Java (05101251)**

**Type of Course:** B.Sc. (IT), BCA, IMCA, IMCA (A.Y.-IV)

**Prerequisite:** Basic Knowledge of Object oriented technology

**Rationale:** True object oriented programming skills for Computer Science Student.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credit | Examination Scheme | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | External | | Internal | | | |
| Lect Hrs/ Week | Tut Hrs/ Week | Lab Hrs/ Week | | T | P | T | CE | P | |
| 3 | 1 | 2 | 5 | 60 | 30 | 20 | 20 | 20 | 150 |

**Lect** - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

**Contents:**

| Sr. | Topic | Weightage | Teaching Hrs. |
|---|---|---|---|
| 1 | **Introduction to JAVA**:<br><br>Java History, Java Features, How Java Differs from C and C+ +Overview of JAVA Language<br><br>Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements, Java Support Systems, Java Environment<br><br>Introduction, Simple Java program, More of Java Statements, Implementing a Java Program,<br><br>Java Virtual Machine, Command Line Arguments, Programming Style<br><br>Constants, Variables, and Data Types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Values to Variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values, Arrays<br><br>Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators<br><br>Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversion and Associativity, Mathematical Functions<br><br>Decision Making and Branching: Introduction, Decision Making with if Statement, Simple if Statement, The if…..else Statement, Nesting of if……Else Statements, The else if Ladder, The Switch Statement,<br><br>The ?: Operator.<br><br>The while Statement, The do Statement, The for Statement, Jumps in Loops Labeled Loops. | 15% | 7 |

| | | | |
|---|---|---|---|
| 2 | **Concept of classes and Inheritance**:<br><br>OOP Concepts (Class, Object,Encapsulation, Inheritance,Polymorphism)<br><br>Overloading (Constructor and Methods)<br><br>Static members<br><br>Varargs<br><br>Inheritance: Extending a Class Overriding Methods<br><br>abstract and final keywords<br><br>Interface | 25% | 12 |
| 3 | **Packages, Multithreading, Exception Handling**:<br><br>Packages, Packages and Member Access, Understanding Protected members,<br><br>Importing packages, Java's standard packages(util, lang)<br><br>The Exception Hierarchy, Exception Handling Fundamentals, try and catch, The Consequences of an Uncaught Exception, Using Multiple catch statements, Catching Subclass Exceptions,<br>nested try blocks, Throwing an Exception, Rethrowing an Exception, Using finally, Using throws, Java's<br>Built-in Exceptions, Creating Exception Subclasses<br><br>Multithreading fundamentals, The Thread Class and Runnable Interface,<br><br>Creating a Thread, Creating Multiple Threads, Determining When a Thread Ends, Thread Priorities,<br><br>Synchronization, Using Synchronized Methods, The synchronized Statement, Thread Communication Using<br><br>notify(), wait() and notifyAll(), Suspending, Resuming, and Stopping Threads | 29% | 14 |
| 4 | **Event Handling, AWT and Swing**:<br><br>Using AWT controls, Layout managers and menus.<br><br>Control Fundamentals - Labels, Buttons, CheckBoxes, CheckboxGroup, Choice Cotrols, Lists, Scroll Bars,<br><br>TextField, TextArea.<br><br>Layout Managers: FlowLayout,BorderLayout, GridLayout, Menu Bars and Menus<br><br>Introducing Swing: The Origins and Design Philosophy of Swing, Swing Components and Containers, Layout<br><br>Introduction to event handing<br><br>Event Delegation Model<br><br>Event classes and event Listeners | 31% | 15 |

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

**Reference Books:**


1. JAVA 2: The Complete Reference
   Patrick Naughton & Herbert Schildt; THM, 1999; Fifth Edition
2. JAVA The Complete Reference
   Herbert Schildt,; Fifth Edition
3. Java: A Beginner's Guide
   Herbert Schildt; Tata McGraw Hill Education Private Limited,2011; Fifth Edition
4. Programming with JAVA
   A.Balaguruswamy,; TMH; Fourth Edition
5. JAVA2 Black Book
   Steven , Holzner; Fifth Edition


**Course Outcome:**

After Learning the course the students shall be able to:

1. Implement object oriented principles using java
2. Identify error and implement exception handling mechanism
3. Develop programs using multi-threading concepts
4. Manage source code in java packages
5. Design and develop java applications using Applets, Abstract Window Toolkit and swing API

**List of Practical:**

1. **Write a java program to display ‘’Hello World”.**
2. **WAP to perform arithmetic operation.**
3. **WAP to calculate simple interest.**
4. **WAP to check the given no is odd or even.**
5. **WAP to find the area of circle.**
6. **WAP to find the largest no amongst three number.**
7. **WAP to draw following pattern**
8. **WAP for simple if statement.**
9. **WAP for If..else statement**
10. **WAP for nested if statement.**
11. **WAP for if..else..if statement.**
12. **WAP for while loop statement.**
13. **WAP for for loop statement.**

14. **WAP for do while loop statement.**

15. **WAP for switch case statement.**

16. **WAP for constructor.**

17. **WAP for constructor overloading.**

18. **WAP for single inheritance.**

19. **WAP for multilevel inheritance.**

20. **WAP for hierarchical inheritance.**

21. **WAP to find area of circle,square and rectangle.(Method Overloading)**

22. **WAP for scanner class.**

23. **Menu Driven Program.**

24. **Initialization of an array.**

25. **Multidimensional Array.**

26. **Addition of an array.**

27. **Subtraction of an array.**

28. **Multiplication of an array.**

29. **WAP to Implement abstract class.**

30. **WAP to Implement interface.**

31. **WAP to use super keyword.**

32. **WAP to implement Exception Handling.**

33. **WAP to create thread.**

34. **WAP to implement String Functions.**

35. **WAP to implement Math Functions.**

36. **WAP to implement various classes of utility package.**

37. **WAP to implement various classes of io package.**

38. **WAP to display message using applet.**

39. **WAP to configure applets.**

40. **WAP to demonstrate Keyboard events.**

41. **WAP to demonstrate Mouse events.**

42. **WAP to implement Graphics Class.**