Third Year B.C.A. (Under Science) Semester V

Course Code: BCA501
Course Title: Core Java
Total Contact Hours: 48 hrs.

Total Credits: 04

Total Marks: 100(60 Lectures)

Teaching Scheme: Theory- 05 Lect./ Week

Course Objectives:

The syllabus aims in equipping students with

- To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- To handle abnormal termination of a program using exception handling

To use the Java SDK environment to create, debug and run simple Java program

Unit No.	Contents	No. of Lectures
Unit 1	**Introduction to Java** **Basics of Programming Language** • History and Features of Java • JDK,JRE,JIT and JVM • Naming Convention • Simple java program • Java IDE –Eclipse/NetBeans (Note: Only for Lab Demonstration) **Introduction to Java** • Data Types • Variable: final, static, abstract • Types of Comments • Array: 1D, 2D, Dynamic array using Vector • Accepting input using Command line argument Accepting input from console (Using BufferedReader and Scanner class)	**04**
Unit 2	**Usage of Objects and Classes** • Defining Your Own Classes • Access Specifiers (public, protected, private, default/friendly) • Array of Objects • Constructor, Overloading Constructors and use of 'this' Keyword • Predefined classes ➢ String class	**04**

	➢ StringBuffer class ➢ Wrapper class • Inner classes, Nested classes, local classes, Anonymous classes(Anonymous object) • Packages: Creation, Access and use • Garbage Collection (finalize( ) Method)	
Unit 3	**Inheritance and Interface** • Inheritance Basics (extends Keyword) • Types of Inheritance • Parent class, Child class and use of 'super' Keyword • Usage of final keyword related to method and class • Usage of abstract class and abstract methods • Interface: Defining and Implementing Interfaces • Runtime polymorphism using interface • Collection interface ➢ Collection framework ➢ Collection interfaces & classes- ArrayList,LinkedList,HashSet,TreeSet ➢ Iterator	**10**
Unit 4	**Exception Handling and I/O** • Exception handling fundamentals • Exception types • Exception class ➢ Checked exception ➢ Unchecked exception • Creating user defined exception • Uncaught exceptions • Assertions • Introduction to Java.io package • Byte streams • Character streams • File IO basics • Object serialization – Reader and Writer	**06**
Unit 5	**Swing , Applet programming** • MVC(Model View Controller) • Swing components : JFrame, JPanel, JButton, JcheckBox, JtextField, JRadioButton, JLabel, JList, JDialog, JFileChooser, JColorChooser,JMenu • Applet fundamentals, Applet lifecycle, Creating and running applets	**07**

	• Applets: Advantages and restrictions	
Unit 6	**Database Programming** • Introduction to JDBC: Architecture (2-tier, 3-tier) • JDBC Drivers • Connectivity with PostgreSQL: basic steps • JDBC statement: Statement, PreparedStatement, CallableStatement • JDBC ResultSet and types • JDBC Metadata – ResultSetMetaData, DatabaseMetaData Transactions: commit(), rollback(), SavePoint()	**06**
Unit 7	**Multithreading** • What are threads? • Life cycle of thread • Creating and using threads using Thread class and Runnable interface • Thread priorities • Running multiple threads, ThreadGroup class • Daemon thread • Synchronization and inter-thread communication(race condition using thread synchronization)	**07**
Unit 8	**Servlets** • Introduction to Servlet and Servlet types • Lifecycle of servlet • Handing HTTPRequest and HTTPResponse • HttpServlet: ➢ Reading form data from servlet ➢ Servlet - Database communication • Session tracking –User Authorization, URL Rewriting, Hidden Form fields, Cookies and HttpSession • Servlet Programs	**08**
Unit 9	**Java Server Pages (JSP)** • Introduction to JSP • Life cycle of JSP • Implicit Objects • Scripting elements –Declarations, Expressions, Scriplets, Comments • JSP Directives – Page Directive, include directive • Simple first JSP program • Mixing Scriplets and HTML Example of forwarding contents from database to servlet, servlet to JSP and displaying it using JSP scriplet tag	**06**

Unit 10 Networking **04**

- Networking basics –Protocol, Addressing, DNS, URL, Socket, Port
- The java.net package-InetAddress, URL, URLConnection class, SocketServer and Socket class
- Creating a Socket to a remote host on a port (creating TCP client and server)
- Simple Socket Program Example

Reference Books:

1. Complete reference Java by Herbert Schildt(5th edition)
2. Java 2 Programming Black Book, Steven Horlzner
3. Programming with java, a Primer, 4th edition, By e balgurusamy
4. Core Java Volume I- Fundamentals, 8th edition, Cay S Horstmann,Gary Cornell, Prentice Hall, Sun MicroSystem Press
5. Core Java Volume II- Advance Features, 8th edition, Cay S Horstmann,Gary Cornell, Prentice Hall, Sun MicroSystem Press