ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

IV SEMESTER **COMPUTER SCIENCE**  TIME: 4HRS/WEEK

CS4603(3) **OBJECT ORIENTED PROGRAMMING THROUGH JAVA** MAX.MARKS:100

w.e.f. 20-21 admitted batch-“20AH” **SYLLABUS**

**Course Objectives:**

* Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods.
* Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
* Understand the principles of inheritance, packages and interfaces.

**Course Outcomes :**

* To recognize how to execute a simple as well as Java application and underlying the principles of Object-Oriented Programming.
* Describe and implement various Inheritance and Polymorphism forms using Java Classes and Interfaces.
* Implement efficient Java applets, exception handling and multithreading concepts in real life programming domains and hence enhance employability skills.

**UNIT I : INTRODUCTION TO JAVA:** Features of Java, The Java virtual Machine, Parts of Java.

**NAMING CONVENTIONS AND DATA TYPES:** Naming Conventions in Java, Data Types in Java, Literals

**OPERATORS IN JAVA:** Operators, Priority of Operators.

**CONTROL STATEMENTS IN JAVA:** if... else Statement, do... while Statement, while Loop, for Loop, switch Statement, break Statement, continue Statement, return Statement

**INPUT AND OUTPUT:** Accepting Input from the Keyboard, Reading Input with Java. util. Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String. format()

**ARRAYS:** Types of Arrays, Three Dimensional Arrays (3D array), array name. length, Command Line Arguments

**UNIT II : STRINGS:** Creating Strings, String Class Methods, String Comparison, Immutability of Strings

**INTRODUCTION TO OOPS:** Problems in Procedure Oriented Approach, Features of Object-Oriented Programming System (OOPS)

**CLASSES AND OBJECTS:** Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors

**METHODS IN JAVA:** Method Header or Method Prototype, Method Body, Understanding Methods, Static Methods, Static Block, The keyword ‘this’, Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods.

**INHERITANCE:** Inheritance, The keyword ‘super’, The Protected Specifier, Types of Inheritance

**UNIT III : POLYMORPHISM:** Polymorphism with Variables, Polymorphism using Methods, Polymorphism with Static Methods, Polymorphism with Private Methods, Polymorphism with Final Methods, final Class

**TYPE CASTING:** Types of Data Types, Casting Primitive Data Types, Casting Referenced Data Types, the Object Class

**ABSTRACT CLASSES:** Abstract Method and Abstract Class

**INTERFACES:** Interface, Multiple Inheritance using Interfaces

**PACKAGES:** Package, Different Types of Packages, The JAR Files, Interfaces in a Package, Creating Sub Package in a Package, Access Specifiers in Java, Creating API Document

**EXCEPTION HANDLING:** Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions, Re – throwing an Exception

**UNIT IV : STREAMS:** Stream, Creating a File using FileOutputStream, Reading Data from a File using FileInputStream, Creating a File using FileWriter, Reading a File using FileReader, Zipping and Unzipping Files, Serialization of Objects, Counting Number of Characters in a File, File Copy, File Class.

**THREADS:** Single Tasking, Multi Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Single Tasking Using a Thread, Multi Tasking Using Threads, Multiple Threads Acting on Single Object, Thread Class Methods, Deadlock of Threads, Thread Communication, Thread Priorities, thread Group, Daemon Threads, Applications of Threads, Thread Life Cycle.

**UNIT V : APPLETS:** Creating an Applet, Uses of Applets, <APPLET> tag, A Simple Applet, An Applet with Swing Components, Animation in Applets, A Simple Game with an Applet, Applet Parameters

**JAVA DATABASE CONNECTIVITY:** Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, Working with MySQL Database, Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements, Using jdbc–odbc Bridge Driver to Connect to Oracle Database, Retrieving Data from MySQL Database, Retrieving Data from MS Access Database, Stored Procedures and Callable Statements, Types of Result Sets

**PRESCRIBED TEXT BOOK:** Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao & Kogent Learning Solutions Inc.

**REFERENCE BOOKS:**

* E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw- Hill Company.
* John R. Hubbard, Programming with Java, Second Edition, Schaum’s outline Series, TMH.
* Deitel&amp;Deitel. Java TM: How to Program, PHI (2007).

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