

**H. N. G. University, Patan**  
**M.C.A(5 Years Integrated Programme) – Semester - IV**  
**403: Object Oriented Programming with JAVA**

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**Unit: 1**

**[25%]**

**Java's Magic:**

The Byte-code, Features of Java, IDE for Java, Object-Oriented Programming in Java, Java Program Structure and Java's Class Library.

**Data Types, Variables, and Operators :**

The Simple Data Types, Literals, Variables, Type Conversion and Casting, Automatic Type Promotion in expressions, Java Operators, Operator Precedence.

**Selection Statements :**

Control Statements – if and switch, Scope of Variable, Iterative Statements – for, while, do... While, Jump Statements.

**Defining Classes :**

Definition of a Class, Definition of Methods, Constructors, Creating Objects of a Class, Assigning Object Reference Variables, The Variable this, Defining and Using a Class, Automatic Garbage Collection.

**Unit :2**

**[25%]**

**Arrays and Strings :**

Arrays, Arrays of Characters, String Handling Using String Class, Operations on String Handling Using String Buffer Class.

**Extending Classes and Inheritance :**

Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, Polymorphism, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier, The Universal Super class-Object Class.

**Packages & Interfaces :**

Understanding Packages, Defining a Package, Packaging up Your Classes, Adding Classes from a Package to Your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface.

**Exception Handling :**

The Idea behind Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions

**Multithreading Programming:**

The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Inter-thread communication, Deadlocks

**Unit : 3**

**[25%]**

**Input/Output in Java :**

I/O Basic, Byte and Character Structures, I/O Classes, Reading Console Input Writing Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File, Stream Benefits.

**Creating Applets in Java:**

Applet Basics, Applet Architecture, Applet Life Cycle, Simple Applet Display Methods, Requesting Repainting, Using the Status Window, The HTML APPLET Tag Passing Parameters to Applets.

**Working with Windows:**

AWT Classes, Window Fundamentals, Working with Frame, Creating a Frame Window in an Applet, Displaying Information Within a Window.

**Unit : 4**

**[25%]**

**Working with Graphics and Texts :**

Working with Graphics, Working with Color, Setting the Paint Mode, Working with Fonts, Managing Text Output Using Font Metrics, Exploring Text and Graphics.

**Working with AWT Controls, Layout Managers and Menus :**

Control Fundamentals, Labels, Buttons, Check Boxes and Check, Box Groups, Choice Controls, Lists, Scroll Bars, Text Field and Text Area Controls, Understanding Layout

Managers, Flow Layout Manager, Border Layout Manager, Grid Layout Manager, Using Insets Manager, Card Layout Manager, Menu Bars and Menus, Dialog Boxes, File Dialog

### **Handling Events in Java :**

Two Event Handling Mechanisms, The Delegation Event Model, The Event Handling Process, Event Classes, Sources of Events, Event Listener Interfaces, Using the Delegation Event Model, Adapter Classes

#### **Text Book:**

1. The Complete Reference JAVA 2, 4th Edition, TMH Publication.
2. Beginning JAVA 2 (JDK1.3 Edition), Ivor Horton, WROX Public.

#### **Reference Book : -**

1. Teach Yourself JAVA, Joseph O'Neil & Herb Schildt, Tata McGraw Hill
2. JAVA 2 UNLEASHED, Tech Media Publications.
3. JAVA 2(1.3) API Documentations.
4. Programming with JAVA: A printer, Balagurusamy, 2nd Edition, Tata McGraw Hill