COURSE OUTLINES

JAVA APPLICATION DEVELOPMENT

Core Java Programming

Learning outcomes

At the end of the course the participant will
✓ Implement Object Oriented Programming Concepts
✓ Use and create packages and interfaces in a Java program
✓ Use graphical user interface in Java programs
✓ Create Applets
✓ Implement exception handling in Java
✓ Implement Multithreading
✓ Use Input/Output Streams
✓ Handle security implementations in Java

Pre-requisites

The course assumes knowledge of Object Oriented Concepts and programming in any Object Oriented language

Course Contents

- Introduction to Java
  - Creation of Java
  - Features of Java
  - Overview of Programming with JDK
  - Discuss the Java Security Model
  - Describe Java Virtual Machine
  - Garbage Collection and Memory Management
  - Sample Programs

- Object Oriented Programming
  - Structures Programming technique
  - Object Oriented Programming and its advantages
  - Define Objects and Classes and the relation between them
  - Explain terms-Attributes, Methods, Construction, Destruction and Persistence
  - Discuss Data Abstraction
  - Discuss Data Encapsulation
- Explain Polymorphism
- Explain Inheritance

**Basics of Java**
- Discuss the data types available in Java and utilize them in applications
- Describe the various control structures and loops available in Java
- Explain and utilize the various operators present in Java
- Explain an Array

**Data Types, Modifiers, Expressions and Operations**

**Arrays and Flow Control Statements**

**Methods and Classes**
- Describe class and inheritance of classes
- Explain and Object and to declare one
- Explain the concept of Constructors and its relation with respect to class
- Methods
- “this” keyword
- Concept of Inner class

**Packages and Interfaces**
- Purpose of Modifies and its types
- Explain Package
- List the various Packages available in Java
- Design user defined Package
- Explain the term interface and how to implement it
- Practice creating an interface and implement it

**String and StringBuffer**
- String Class
- Various Methods of the String class and how to use them
- Explain StringBuffer class
- Discuss the methods of the StringBuffer class and its usage

**Java Applets**
- Difference between Applications and Applets
- Understand the Applet Class
- Create, run and execute Applets
- Understand the Security Restrictions applied on Applet
- Identify the various activities in an applet
- Identify how to use Components and layouts in Applets

**Graphics**
- Basics of Graphic System
- Explain and utilize the following geometric figures in applications
  - Lines
  - Ovals
  - Rectangle and RoundRectangle
  - 3DRectangle and Arc
- Discuss Color Control and how to use it to fill color in the container and the images in it
Discuss the Font Control and how to play around with it

- Explain the FontMetrics class and its purpose

**Basic Graphical User Interface Components (Abstract Window ToolKit (AWT))**

- Describe the concept of GUI
- Discuss the following Handle events using the following listeners
  - ActionListener
  - ItemListener
  - WindowListener
  - ComponentListener
  - MouseListener
  - MouseMotionListener
- Describe the following components and how to apply them in the container
  - Label
  - List
  - Button
  - Checkbox
  - Choice
  - TextField
  - TextArea
  - FileDialog

**Advanced GUI Components**

- Discuss event handling related to mouse events
- Describe the LayoutManager class and implement the types of layout in the application
- Discuss the various containers and how to implement them
- Understand Menus and apply them in the frame

**Exception Handling**

- Discuss the purpose of Exception Handling in Java
- Explain the types of exception in Java
- Describe the use of try and catch
- Explain the use of throws keyword
- Explain the purpose of throw
- Describe the finally keyword

**Multithreading**

- Describe Multithreading
- Creating and Managing Threads
- Discuss the life cycle of threads
- Understand the concept of synchronization
- Explain how to set the priorities of thread
- Understand what a daemon thread does