

JAVA Programming and security

Outline of Course

S. No. Topic

1. Introduction to Object Oriented Programming
2. Introduction to Java programming Language.

1. Introduction to Object Oriented Programming

- 1) Thinking Object-Oriented
 - Why Is OOP Popular? A New Paradigm, A Way of Viewing the World.
- 2) Abstraction
 - Layers of Abstraction, Other Forms of Abstraction.
- 3) Classes and Methods
 - Encapsulation, Class Definitions, Methods.
- 4) Messages, Instances, and Initialization
 - Message-Passing Syntax, Statically and Dynamically Typed Languages, Accessing the Receiver from Within a Method, Object Creation, Constructors
- 5) Inheritance and Substitution
 - An Intuitive Description of Inheritance, Inheritance in Various Languages, [Subclass, Subtype, and Substitution], Overriding and Virtual Methods, Interfaces and Abstract Classes, Forms of Inheritance, The Benefits of Inheritance, The Costs of Inheritance. Examples (Language independent)
- 6) Static and Dynamic Behavior
 - Static versus Dynamic Typing, Static and Dynamic Classes, Static versus Dynamic Method Binding.
- 7) Multiple Inheritance
 - Inheritance as Categorization, Problems Arising from Multiple Inheritance, Inner Classes.
- 8) Polymorphism and Software Reuse
 - Polymorphism in Programming Languages, Mechanisms for Software Reuse, Efficiency and Polymorphism, Will Widespread Software Reuse Become Reality?
- 9) Overloading and Overriding
 - Type Signatures and Scopes, Overloading Based on Scopes, Overloading Based on Type Signatures, Redefinition, Notating Overriding, Replacement versus Refinement, Deferred Methods, Overriding versus Shadowing, Covariance and Contra variance.

2) Introduction to Java Programming Language

1) An Introduction to Java

- Java as a Programming Platform, The Java "White Paper" Buzzwords, Java and the Internet, A Short History of Java, Common Misconceptions About Java.

2) The Java Programming Environment

- Installing the Java Development Kit, Choosing a Development Environment, Using the Command-Line Tools, Using an Integrated Development Environment, Compiling and Running Programs from a Text Editor, Running a Graphical Application, Building and Running Applets.

3) Fundamental Programming Structures in Java

- A Simple Java Program, Comments, Data Types, Variables, Operators, Strings, Input and Output, Control Flow, Big Numbers, Arrays.

4) Objects and Classes

- Introduction to Object-Oriented Programming, Using Predefined Classes, Defining Your Own Classes, Static Fields and Methods, Method Parameters, Object Construction, Packages, Documentation Comments,.

5) Inheritance

- Classes, Superclasses, and Subclasses, Object: The Superclass,

6) Abstract classes and Interfaces

7) Introduction to GUI

- AWT Architecture, Light-Weight vs Heavy-Weight, AWT Event Model, AWT Event Hierarchy & Event Handling, Using Top-Levels, components and containers, Introduction to Layouts, Focus Architecture.

8) Graphics Programming

- Java2D Rendering Model, Strokes & Fills, Geometries, Fonts and Text Layout, Transformations, Display and manipulation of Images and offscreen buffers, Using Color, Printing through Java,

9) User Interface Components with Swing

- The Model-View-Controller Design Pattern, Introduction to Layout Management, Text Input, Choice Components, Menus, Sophisticated Layout Management, Dialog Boxes.

10) Deploying Applets and Applications

- Applet Basics, The Applet HTML Tags and Attributes, Multimedia, The Applet Context, JAR Files, Application Packaging, Java Web Start,

Storage of Application Preferences.

11) Exceptions and Debugging

- Dealing with Errors, Catching Exceptions, Tips for Using Exceptions, ,

12) Database Programming

- The Design of JDBC, The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Metadata, Row Sets, Transactions, Advanced Connection Management, Introduction to JAVA Security

13) Java Server Pages

- Introduction to JSP, Lifecycle of JSP, Creating a JSP Page, JSP Scripting Elements, Scriptlet Tag, Declaration Tag ,Directive Tag ,Expression Tag

14) Servlets

- Introduction to Web, Introduction to Servlet, Servlet API, How a servlet application work, Servlet Life Cycle, Steps to create servlet using Tomcat server, Steps to create servlet in Eclipse IDE

15) Project Work