**Tentative Course Outline**

(Please note: This course outline is a tentative outline, we will make every attempt to follow this outline. However, deviations from this outline may become necessary)

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| Course Schedule | | | |
| Week | Topic | Topics | Reading |
| 1 | Introduction To Java Programming | Java/JVM, Java Applications, Development Tools, Sample Program, Compilation, Java Primitive Data Types and Operations, Program Structures |  |
| 2 | Fundamentals of Java | Variables, Constants Data Types & Type Conversions, Comments, Arithmetic/Relational Operators, Output and Formatting Output. |  |
| 3 | Java Control Structures | Conditional IF Block, For, While Loops, Switch Selection Block, Unit Testing with Junit, Good design and programming practice, Simple UML class diagrams. |  |
| 4 | Classes and Interfaces | Classes & Objects, Constructors, Properties & Access Specifiers, Java Class Library, Encapsulation,  Object Parameters, The Object Class, Cloning Objects, Serialization of Objects, Inheritance, Polymorphism, Abstract Classes & Interfaces, Object-Oriented Design |  |
| 5 | Java Methods | Defining Methods, Calling Methods, Parameter Values Scoping, Method Overloading, Method Overriding, Virtual Functions |  |
| 6 | Processing Strings | Creating Strings, String Operations & Methods, String Class, StringBuilder/StringBuffer Class, Character Class, Text I/O |  |
| 7 | Arrays | Array Basics, Array Parameters, Variable Length Array Parameters, Searching Arrays, Array Class, Multi-dimensional Arrays, ArrayLists |  |
| 8 | Exception Handling and Multithreading | Overview, Benefits, Exception Types Try....Catch.... Finally Block Throwing Exceptions, Assertions, Concurrency and Multi-threading, Synchronization of access to objects |  |
| 9 | Generic Programming and File Processing | Collections & Generics, Generic Classes and Methods, Custom Generic Data Structures, Reflection and Generic Programming / Templates, Java SE 8 Lambdas and Streams, File Class, Reading & Writing Text Files |  |
| 10 | Design Patterns | Observer, Strategy, Composite, Decorator, Iterator, Adaptor, Command, Factory Method, Proxy, Singleton, and Visitor |  |
| 11 | Java GUI | Overview & Java IDEs, Getting Started with GUI Programming, Creating User Interfaces, Swings vs AWT, Swing Controls, Event Driven Programming, Event Handling, Swing Models, Menus, Toolbars, Dialogs, Containers, Layout Managers, and Borders, JavaFX Graphical User Interface |  |

Book Reference

1. Big Java Early Objects by Cay S. Horstmann
2. Core Java Volume I--Fundamentals 10th Edition by Cay S. Horstmann
3. Java SE 8 for the Really Impatient by Cay S. Horstmann
4. Java The Complete Reference Ninth Edition by Herbert Schildt
5. Java A Beginner’s Guide by Herbert Schildt

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| Lecture # | Topics | Laboratory |
|  | Java/JVM, Java Applications, Development Tools, Sample Program, Compilation |  |
|  | Java Primitive Data Types and Operations |  |
|  | Program Structures |  |
|  | Variables, Constants Data Types & Type Conversions, Comments, |  |
|  | Logical, Bitwise,Relational, Arithmetic Operators |  |
|  | Input, Output and Formatting. |  |
|  | Conditional IF Block, For, While Loops, Switch Selection Block |  |
|  | Unit Testing with Junit |  |
|  | Good design and programming practice, Simple UML class diagrams |  |
|  | Classes & Objects, Constructors, Properties & Access Specifiers, Java Class Library |  |
|  | Encapsulation,  Object Parameters, The Object Class, Cloning Objects, Serialization of Objects, Inheritance, Polymorphism |  |
|  | Abstract Classes & Interfaces, Object-Oriented Design |  |
|  | Defining Methods, Calling Methods, Parameter Values Scoping |  |
|  | Method Overloading, Method Overriding, Virtual Functions |  |
|  | Creating Strings, String Operations & Methods |  |
|  | String Class, StringBuilder/StringBuffer Class, Character Class, Text I/O |  |
|  | Array Basics, Array Parameters, Variable Length Array Parameters |  |
|  | Searching Arrays, Array Class, Multi-dimensional Arrays, ArrayLists |  |
|  | Overview, Benefits, Exception Types Try....Catch.... Finally Block Throwing Exceptions |  |
|  | Assertions, Concurrency and Multi-threading, Synchronization of access to objects |  |
|  | Collections & Generics, Generic Classes and Methods, Custom Generic Data Structures, Reflection and Generic Programming / Templates |  |
|  | Java SE 8 Lambdas and Streams |  |
|  | File Class, Reading & Writing Text Files |  |
|  | Java Design Patterns, Observer, Strategy, Composite, Decorator |  |
|  | Iterator, Adaptor, Command, Factory Method |  |
|  | Proxy, Singleton, and Visitor |  |
|  | Overview & Java IDEs, Getting Started with GUI Programming, Creating User Interfaces, Swings vs AWT, Swing Controls, Event Driven Programming |  |
|  | Event Handling, Swing Models, Menus, Toolbars, Dialogs, Containers, Layout Managers, and Borders |  |
|  | JavaFX Graphical User Interface |  |