Course Content Core Java [190 Hours OR 95 Sessions]

Index	Topics	Duration
1	Introduction to Java	6 Hours
	a) Flavors of Java, History of Java, Features of Java, Introduction to JDK, JRE, JVM and JIT Compiler.	
2	Platform Independency in java	2 Hours
	a) Difference between Compiler and Interpreter	
3	Moving towards First Program of Java	4 Hours
	a) Description of main method	
	b) How to download and install Java	
	c) First Java program using Notepad, Edit plus and Eclipse IDE	
	d) Command Line Argument	
4	Types of Literals in java	8 Hours
	a) Integral Literal b) Floating point Literal c) Char Literal d) Boolean Literal e) String Literal f) null literal	
5	Operators	2 Hour
	a) Arithmetic Operator b) Unary Operators c) Assignment Operator	

	d) Relational Operator e) Logical Operators f) Boolean Operators g) Bitwise Operators h) Ternary Operator i) Member Operator(.) j) new Operator k) instanceof Operator	
6	Programs on Method Parameter and return type	4 Hours
7	Introduction to Object Oriented Programming	16 Hours
	a) OOPs Features and Advantages	
	b) Class, Object, Abstraction, Encapsulation, Inheritance and Polymorphism	
	c) Default constructor added by compiler	
	d) Why compiler adds default constructor to our class	
	e) Types of variables (Primitive and Reference)	
	f) Instance variable, Static variable, Parameter variable and local variable	
	g) How to provide our own user defined values for instance variable	
	h) this keyword	
	i) Role of instance variable while creating the Object	
	j) Working with static variable while creating the Object	
	k) When we should declare a variable as an instance or static variable?	
	l) Data Hiding	
	m) Abstraction	
	n) Encapsulation	

	o) How to print object properties value (instance variable value)	
	p) Setter and Getter	
8	Introduction to Constructor	6 Hours
	a) Advantage of Constructor	
	b) Types Of Constructor	
	c) Default, No Argument and Parameterized Constructor	
	d) Passing Object reference to the constructor(Copy Constructor)	
	e) Instance Block in java	
	f) How many ways we can initialize object properties(instance variable)	
9	Relationship between the classes	8 Hours
	a) IS-A (Inheritance) Relation and HAS-A(Association) Relation	
	b) Introduction to Inheritance (IS-A relation)	
	c) Types of Inheritance	
	d) this() and super()	
	e) Why java does not support multiple inheritance	
	f) Access modifiers in Java	
	g) HAS-A relation(Association)	
	h) Composition and Aggregation	
10	Wrapper classes in Java	2 Hours
	a) Autoboxing and Unboxing	
11	Introduction to Polymorphism	10 Hours
	a) Method Overloading, Var-Args,	
	b) Ambiguity issues while overloading a method	

	c) Method Overriding	
	d) Upcasting and Downcasting	
	e) @Override Annotation	
	f) Role of Access Modifier while Overriding a method	
	g) Co-variant concept in method overriding	
	h) Method Hiding	
12	Final and Sealed keywords in Java	2 Hours
13	Object class and its method	4 Hours
	a) getClass(), hashCode(), toString(), equals(Object o), clone()	
	b) wait(), notify(), notify All() finalize()	
14	Record class in Java	
15	Abstract class and abstract methods	4 Hours
16	Introduction to interface	10 Hours
	a) Default and static method(**Java 8 features**)	
	b) Functional interfaces	
	c) Lambda Expression	
	c) Predicate<T>, Consumer<T>, Supplier<T>, Function<T,R>, BiPredicate<T,U>, BiConsumer<T,U>	

	d) Marker interface e) Difference between Abstract class and Interface	

17	Enum in java	2 Hours
	a) Writing enum inside the class, Outside of the class and inside the method. b) Writing Constructor inside an enum. c) Passing enum in switch expression	
18	JVM Architecture	10 Hours
	a) Class loader subsystem, Runtime Data areas and Execution Engine	
	b) Different types of class loaders	
	c) static block in Java	
	d) ClassNotFoundException and NoClassDefFoundError	
	e) Drawback of new keyword	
	f) Method Area, Heap Memory, Stack Memory, PC register, Native Method Stack.	
	g) Garbage Collector	
	h) Heap and Stack diagram Programs	
	i) Execution Engine and JIT Compiler	
19	Arrays in java (Logical Session)	
	a) 1-D Array, 2-D Array	
	b) Multi-Dimensional Array	
	c) Interview Standard Coding	
20	d) Arrays class methods	
21	Exception Handling in Java	12 Hours
	a) Introduction to Exception	
	b) Exception Hierarchy	
	c) Different Criteria of Exception	
	d) try-catch block	

	e) Working with Generic and Specific Exception	
	f) Nested try catch, try with multi catch block (1.7)	
	g) Dealing with Infinity and NaN	
	h) Finally block	
	i) Try with Resources (1.7)	
	j) Exception Propagation	
	k) Checked and Unchecked Exception	
	l) throw and throws keyword	
	m) User-defined checked and unchecked Exception	
	n) Various Test cases with Checked and Unchecked Exception	
	o) Remaining methods of Object class clone() and finalize()	

22	Introduction to Multithreading	14 Hours
	a) Introduction to Process, Thread, Multitaskingand multithreading	
	b) Creating Thread by using Thread class and Runnable interface	
	c) Various methods of Thread class like start(), run(), isAlive(), sleep(long ms), join(), setName() getName(), currentThread(), setPriority(), getPriority()	
	d) Implementation of Runnable interface by using **Lambda Expression**	
	e) Race condition in multithreading	
	f) Synchronization (Method and block level)	
	g) Object and class level Synchronization	
	h) Thread life cycle	
	i) Thread Group and Thread Pool	
	j) Inter Thread Communication(ITC)	
	k) Deadlock in multithreading	
	l) interrupt() method of Thread class	
	m) Daemon Thread in Java	
23	Introduction to Java I/O Streams	8 Hours
	a) Introduction to Stream	
	b) Working with Binary Stream and Character Stream	
	c) Reading/Writing data to the File	

	d) Working with various Streams like FileInputStream, FileOutputStream SequenceInputStream, BufferedOutputStream, BufferedInputStream, BufferedOutputStream, DataOutputStream, DataInputStream	
	e) Working with Reader and Writer like FileReader, FileWriter, PrintWriter and so on	
	f) Serialization and De-Serialization	
	g) transient keyword role in Serialization	