Department of Computer Science & Engineering

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ME-RIISE

(Malnad Enclave for Research, Innovation, Incubation, Startups & Entrepreneurship)

MICRO ENGINEERING CERTIFICATION COURSE
ON

CORE JAVA: AN INDUSTRIAL APPROACH

Course Patron

Course Delivery	Date	Fee
Orientation	22 Oct 21 6 PM	-
Chapter 1 to Chapter 5	23 & 24 Oct 21	100/-
Chapter 6 to Chapter 30	25 Oct Onwards	5900/-

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Course Summary

Course Duration: 120 Hours

Resource Person: R.Praveen Chandra Goud, Senior Java Consultant.

Purpose of the course: This is comprehensive certification course in Core Java that will make you grow in your software coding career. This course includes the basics of Java, Java statements, exception handling, Objects, Classes and so on.

Syllabus:

Chapter 1 :

- Introduction to the course & its pre-requirements.
- Platform dependency & platform independency.
- Relation b/w internet & platform independency.
- Birth of java.
- Procedure followed by the system to execute a 'c' program & its disadvantages.
- Static loading & dynamic loading.

Chapter 2 :

- Need for J.V.M & its basic functionalities.
- Procedure followed by J.V.M to execute a java application.
- Why executable code could not be seen in java.
- Implementation of platform independency in java.
- What is bytecode & '.class' files.
- Why java is platform independent even if J.V.M is platform dependent.

Chapter 3:

- Introduction to oop's concepts.
- Need for encapsulation.
- Disadvantages of structured programing language like 'c'.

Chapter 4:

- What is encapsulation?
- What is class?
- What is binding?
- What is jdk & jre?
- Relation b/w jdk & jvm .
- Relation b/w jre & jvm.
- Installation of jdk. Library's in java & rt.jar file.
- Environment variables path & classpath.

Chapter 5:

- Writing first java program. coding standards to be followed
    - In java programming.
- Compiling & executing a java program.
- Need for object in java.
- What is object, reference & instance.
- Difference & relation b/w instance & object.
- Relation b/w object & functions.
- What object contains? & what is state of the object
    - & behaviour of the object
    - & persistency period of the object in java.

Chapter 6:

- Procedure followed by the java compiler to compile
    - a java program.
- Advantage of saving the source file with the
    - name of the class.

Chapter 7:

- Primitive data types in java.
- Default initialization.
- Typecasting in java.

Chapter 8:

- Creating multiple object's of the same class.
- Difference b/w ref & pointer.
- What is hashcode.
- Why people say java doesn't support pointers.
- Relation b/w pointer's & java language.

Chapter 9:

- Creating object of any class anywhere.
- Manipulating ref:
    - Creating multiple ref's to the same object.
    - Assigning a new object to the old ref.

Chapter 10:

- Five different locations where we can see objects in java.
    - defining object as local to function.
    - defining object as an instance variable.
    - defining object as parameter of a method.
    - defining object as the return datatype of a method.
    - defining object as static variable.
    - has-a-relation & is-a-relation.

Chapter 11:

- Static keyword.
- Context of the class.
- Static var's & method's.
- Difference's b/w object of the class & context of the class.
- Accessing static members with in the same class.
- Relation b/w object & context of the class.
- Accessing static members of one class in another class.

Chapter 12:

- Polymorphysm:
- What is polymorphysm.
- Static polymorphysm & dynamic polymorphysm.
- Method overloading or overwriteing.
- Difference b/w static polymorphysm & dynamic polymorphysm.
- The key based on which static polymorphysm would work in java.
- The three rules of polymorphysm.
- When static polymorphysm breaks(dis advantages of static polymorphysm).
- Applications of polymorphysm.

Chapter13:

- Constructors:
- What is a constructor & its need.
- Difference b/w constructors & methods.
- Relation b/w constructors & object.
- Default constructor.
- Constructor overloading.

Chapter 14:

- 'This' operator :
- Functionality of 'this' operator.
- The two uses of 'this' operator.
- Limitations of 'this' operator.

Chapter 15:

- Packages & import keyword.
- Default package in java('java.lang').
- String class.
- Stringbuffer & stringbuilder classes.

Chapter 16:

- Array's.
- Command line arguments.

Chapter 17:

- Introduction to inheritance:
- What is inheritance?
- Superclass & subclass & extends keyword.
- Relation b/w subclass object & superclass object.
- Different types of inheritance's.
- Multilevel inheritance.
- 'Object' class.
- Method over rideing.
- Multiple inheritance.
- Cyclic inheritance.
- 'Super' keyword & its two uses & its limitations.
- Superclass ref & subclass object.
- Dynamic object dispatch & dynamic polymorphism.
- Tostring method & hashcode method of object class.
- 'Final' keyword.

Chapter 18:

- Introduction to interfaces.
- What is late binding & early binding.
- What is an interface.
- Abstract methods.
- Introduction to the 'implements' keyword.
- The functionality of 'implements' keyword.
- Difference b/w extends keyword & implements keyword.
- Class implementing multiple interfaces simultaneously.
- Handling object of the class with the ref of an interface.
- Implementing the concept of latebinding or lose cuppleing using interfaces.
- Multiple inheritance in interfaces.
- Methods returning objects of interfaces & its advantages.
- Anonymous inner classes.
- The two different ways in which a class can implement an interface.
- The three different objects which could be assigned to the ref of an interface.
- Final variables in an interface.

Chapter 19:

- Abstract classes.

Chapter 20:

- Access spacesfiers.
- Inner classes.
- Factory methods.

Chapter 21:

- Introduction to exceptions & exception handling.
- Errors & error handling concept.
- Compilation errors & runtime errors.
- The three different reasons for a compilation error.
- Reasons for a runtime error.
- Logical error.
- Abnormal termination and its disadvantages.

Chapter 22:

- What is an exception?
- Exception classes & its hierarchy.
- Relation b/w exceptions & runtime error & abnormal termination.
- What is exception handling.
- Try & catch blocks.
- Defining multiple catch blocks to a single try & its advantages & dis advantages.
- Defining a single catch to handle any exception.
- Simple logical errors & serious logical errors.
- Error classes.

Chapter 23:

- Checked exceptions & unchecked exceptions.
- Throws keyword & its two uses.
- Finally blocks.
- User defined logical errors & user defined exceptions.
- Throw keyword.
- Assert keyword.

Chapter 24:

- Introduction to multitasking.
- What is multitasking .
- Advantages of multitasking.
- Thread based multitasking & process based multitasking.
- What is a thread.
- Difference b/w thread & function.
- Defining a functionality as a thread & executing a functionality as a thread.
- Runnable interface & thread class.

Chapter 25:

- Introduction to multithreading.
- Scheduling of threads.
- Explicitly suspending a thread in the middle of its execution in three different ways:
- Controlling the execution of threads.
- Inter thread communication & thread synchronization.
- Priorities of threads.
- Life cycle of threads.
- Deamon threads & user threads.

Chapter 26:

- Introduction to iostreams.
- What is io-stream & why do we need io-streams in java?
- Introduction to 'java.io' package.
- Basic hierarchy of java.io package classes.
- Printing or sending the data to the console(println method).

Chapter 27:

- Reading the data from the console(readline method).
- File handling in java.
- Serialization.
- Marker interfaces.

Chapter 28:

- Introduction to collections.
- Differences b/w arrays & collections.
- Relation b/w arrays & collections.
- Advantages of collections and its role in the realtime projects.

Chapter 29:

- The three different types of Collections in java.
- Hierarchy of collection classes in java api.
- List Collections.
- Map Collections.
- Set Collections.

Chapter 30:

- Features of java7.
- Variable length arguments or var args.
- Auto boxing and auto unboxing.
- For each loop.
- Catch block with multiple exception's.