B. TECH. SEMESTER III
SCHEME & SYLLABUS FOR THE SUBJECT
CE 311 – OBJECT ORIENTED PROGRAMMING WITH JAVA

Teaching Scheme (Hours/Week)			Exam Scheme					
Lecture	Tutorial	Practical	External (3 Hrs.)	Sessional (1:15 Hrs.)	Practical	Termwork	Total	Credit
4	-	2	60	40	25	25	150	5

- **Introduction**
  Programming language Types and Paradigms, Flavors of Java, Java Designing Goal, Features of Java Language, JVM – The heart of Java, Java's Magic Bytecode

- **Language Fundamentals**
  The Java Environment: Java Program Development, Java Source File Structure, Compilation Executions
  Basic Language Elements: Lexical Tokens, Identifiers, Keywords, Literals, Comments, Primitive Data-types, Operators

- **Object Oriented Programming**
  Class Fundamentals, Object and Object reference, Object Life time and Garbage Collection, Creating and Operating Objects, Constructor and initialization code block, Access Control, Modifiers, Nested class, Inner Class, Anonymous Classes, Abstract Class and Interfaces, Defining Methods, Method Overloading, Dealing with Static Members, Use of "this" reference, Use of Modifiers with Classes & Methods, Generic Class Types

- **Extending Classes and Inheritance**
  Use and Benefits of Inheritance in OOP, Types of Inheritance in Java, Inheriting Data Members and Methods, Role of Constructors in inheritance, Overriding Super Class Methods, Use of "super", Polymorphism in inheritance, Type Compatibility and Conversion, Implementing interfaces.

- **Package**
  Organizing Classes and Interfaces in Packages, Package as Access Protection, Defining Package, CLASSPATH Setting for Packages, Making JAR Files for Library Packages, Import and Static Import, Naming Convention for Packages

- **Exception Handling:**
  The Idea behind Exception, Exceptions & Errors, Types of Exception, Control Flow In Exceptions, JVM reaction to Exceptions, Use of try, catch, finally, throw, throws in Exception Handling, In-built and User Defined Exceptions, Checked and Un-Checked Exceptions

- **Array & String :**
  Defining an Array, Initializing & Accessing Array, Multi –Dimensional Array, Operation on String, Using Collection Bases Loop for String, Tokenizing a String, Creating Strings using StringBuffer

- **Thread :**
  Understanding Threads, Needs of Multi-Threaded Programming, Thread Life-Cycle, Thread Priorities, Synchronizing Threads, Inter Communication of Threads

- **Applet**
  Applet & Application, Applet Architecture, Parameters to Applet

- **A Collection of Useful Classes**
  Utility Methods for Arrays, Observable and Observer Objects, Date & Times, Using Scanner, Regular Expression

- **Input/Output Operation in Java**
  Streams and the new I/O Capabilities, Understanding Streams, The Classes for Input and Output, The Standard Streams, Working with File Object, File I/O Basics, Reading and Writing to Files, Buffer and Buffer Management, Read/Write Operations with File, Channel, Serializing Objects

- **GUI Programming**
  GUI Features Using Swing Components

- **Java Utilities (java.util Package) The Collection Framework :**
  Collections of Objects, Collection Types, Sets, Sequence, Map, Understanding Hashing Use of ArrayList & Vector

- **Event Handling**

Event-Driven Programming in Java, Event- Handling Process, Event-Handling Mechanism, The Delegation Model of Event Handling, Event Sources Event Listeners, Adapter Classes as Helper Classes in Event Handling, Event Types and Classes

Text Book:

1) Core Java Volume I – Fundamentals, 8th Edition, Cay Horstmann and Gray Cornell, Pearson Education

Reference Books:

1) Thinking in Java by Bruce Eckel, 4th Ed., Pearson Education
2) Learning Java by By Patrick Niemeyer and Jonathan Knudsen, 4th Ed., O'reilly Media