Name of Department:- Computer Science and Engineering

1. Subject Code: TCS 408 Course Title: **Java Programming Language**
2. Contact Hours: L: 3 T: - P: -
3. Semester: IV

4. Pre-requisite: TCS 101, TCS 201, TCS 302, TCS 307

5. Course Outcomes: After completion of the course students should be able to

1. Explain the Java programming features and develop programs to demonstrate the same.
2. Make use of object oriented concepts to develop applications
3. Classify exceptions and demonstrate applications for file handling and multithreading.
4. Analyze collection framework and develop applications using GUI.
5. Compare and utilize collection framework for programming applications
6. Design applications for event handling and accessing databases using Java features.

Detailed Syllabus

UNIT	CONTENTS	Contact Hrs
Unit - I	**Introduction to Java :**Importance and features of Java, Concepts of Java Virtual machine (JVM) Keywords, Constants, Variables and data types, operators and expressions, Control statements, Conditional statements, loops and iterations, Wrapper classes, Scanner Class: Scanner class methods (next(),nextLine() etc. **Concept of class:** Class definition, adding variables and methods, creating objects, constructors, defining methods, calling methods, Arrays,String Handling in java(String, StringBuffer classes)	**10**
Unit - II	**Object Oriented Programming concepts:** Inheritance, super classes, multilevel hierarchy, abstract and final classes, overloading and overriding **Packages and interfaces**: Packages, Defining Packages, Using Packages, import and static import, Access protection. **Interface:** Defining Interfaces, abstract methods declarations, implementing interfaces, extended interfaces, interface references.	**9**
Unit – III	**Exception handling:** Exception Types, Exception class, RuntimeException Class, Error Class, Checked and uncheced Exceptions, Defining new exceptions; Handling: try, catch and finally; throw statement, throws clause. **Input/Output:**Basics, Byte and Character Streams, reading and writing from console and file.	**9**

	Multithreaded programming: Java thread model, synchronization, messaging, thread class, Runnable interface, inter thread communication, Producer/ consumer problems, Wait () and notify ().	
Unit – IV	**Collection and Generic Framework:** Introduction to Collection and Generic Framework: Interfaces Iterator, List, Set, ArrayList, LinkedList HashSet and ArrayDeque classes **AWT & Swing:** Introduction to AWT and Swings, Swings advantages over AWT, Swing applications, Swing Controls : JButton ,JLabel , JCheckBox , JRadioButton , JList , JComboBox, JTextFiled, JTextArea , JScrollBar, JTable, Graphics in swing	**9**
Unit – V	**Event Handling:**Event delegation model, classes, Event Listener Interfaces, Adapter classes. **Java Database Connectivity (JDBC):**The Concept of JDBC, JBDC drivers(Type1 Driver,Type4 Driver), Connection interface, Statement interface, ResultSet interface, Creating and executing SQL statements.	**9**
	Total	**46**

Text books:

1. Patrick Naughton and Herbert Schildt, "Java 2 The Complete Reference", 9th edition, McGraw Hill Education, 2017.
2. Bruce Eckel, "Thinking in Java", 4th edition,Pearson Education India, 2008
3. E. Balaguruswamy, "Programming with Java a Primer", 4thedition, Tata McGraw Hill, 2009.

Reference Books:

1. Cay S Horstmann and Gary Cornell, "Core Java Volume –I and II", Standard edition, Sun Microsystems, 2001
2. Harvey Deitel and Paul Deitel, "Java How to Program" , 4thedition, PHI Learning, 2004