## JAVA PROGRAMMING

**B Tech II Year II Sem**

| Course Code | Category | Hours/ Week | | | Credits | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| **23IT405** | **Professional Core** | **L** | **T** | **P** | **2** | **CIE** | **SEE** | **TOTAL** |
| | | **2** | **0** | **0** | | **40** | **60** | **100** |
| **Contact Classes: 48** | **Tutorial Classes: Nil** | **Practical Classes: -** | | | | **Total Classes:48** | | |

**Course Objectives:**
- To introduce object-oriented programming principles and apply them in solving problems.
- To introduce the implementation of packages and interfaces.
- To introduce the concepts of exception handling and multithreading.
- To introduce the design of Graphical User Interface using swing controls.

**Course Outcomes:**
- Able to solve real world problems using OOP techniques.
- Able to solve problems using java collection framework and I/O classes.
- Able to develop multithreaded applications with synchronization.
- Able to design GUI based applications.

**UNIT – I**

**Foundations of Java:** History of Java, Java Features, Variables, Data Types, Operators, Expressions, Control Statements. Elements of Java - Class, Object, Methods, Constructors and Access Modifiers, Generics, Inner classes, String class and Annotations.

**OOP Principles:** Encapsulation – concept, setter and getter method usage, this keyword. Inheritance - concept, Inheritance Types, super keyword. Polymorphism – concept, Method Overriding usage and Type Casting. Abstraction – concept, abstract keyword and Interface.

**UNIT – II**

**Exception Handling:** Exception and Error, Exception Types, Exception Handler, Exception Handling Clauses – try, catch, finally, throws and the throw statement, Built-in-Exceptions and Custom Exceptions.

**Files and I/O Streams:** The file class, Streams, The Byte Streams, Filtered Byte Streams, The Random Access File class.

**UNIT – III**

**Packages-** Defining a Package, CLASSPATH, Access Specifiers, importing packages. Few Utility Classes - String Tokenizer, BitSet, Date, Calendar, Random, Formatter, Scanner.

**Collections:** Collections overview, Collection Interfaces, Collections Implementation Classes, Sorting in Collections, Comparable and Comparator Interfaces.

**UNIT – IV**

**Multithreading:** Process and Thread, Differences between thread-based multitasking and process based multitasking, Java thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.
**Java Database Connectivity:** Types of Drivers, JDBC architecture, JDBC Classes and Interfaces, Basic steps in Developing JDBC Application, Creating a New Database and Table with JDBC.

**UNIT - V**
**GUI Programming with Swing –** Introduction, limitations of AWT, MVC architecture, components, containers, Layout Manager Classes, Simple Applications using AWT and Swing.
**Event Handling-** The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes.

**TEXT BOOKS:**
1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt. Ltd.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

**REFERENCE BOOKS:**
1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Object Oriented Programming through Java, P. Radha Krishna, University Press.
4. Programming in Java, S. Malhotra, S. Chudhary, 2nd edition, Oxford Univ. Press.
5. Java Programming and Object-oriented Application Development, R. A. Johnson, Cengage Learning.