MCAH103: OBJECT ORIENTED PROGRAMMING WITH JAVA

Hours/Week: 4 I.A. Marks: 30

Credits: 4 Exam. Marks: 70

Course Learning Objectives: Students will try to learn,

1. The model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism.
2. Fundamental features of an object oriented language like Java: object classes and interfaces, exceptions and libraries of object collections.
3. Discuss the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program written in Java.
4. How to test, document and prepare a professional looking package for each business project using javadoc.

Course Outcomes: After completing the course, the students will be able to,

CO1: Understand object oriented software development using the Java language.
CO2: Study the principles of inheritance and polymorphism; and demonstrates how they relate to the design of abstract classes.
CO3: Understand the implementation of packages and interfaces.
CO4: Realize an exception handling, event handling and multithreading.
CO5: Design Graphical User Interface using applets and swing.
C06: Understanding the threading and multithreading and their corresponding classes.
C07: Realize the importance of Lambda expressions in OOPs.

UNIT-I **12Hrs.**

Object Oriented Programming Principles, Need for OOP Paradigm, Introduction to Java, Characteristics, Data Types, Variables, Arrays. Control Statements: Selection, Iteration, Jump Statements, Operators, Introduction to Classes, Class Fundamentals, Constructor, Methods, Stack Class, Inheritance, Creating Multilevel Hierarchy, Method Over-Riding, Packages And Interfaces, Exception Handling, Multi-Threaded Programming, I/O Applets Java Library, String Handling, String Comparison, String Buffer.

UNIT-II **12Hrs.**

Inheritance, Package and Interface: Inheritance, Types of Relationships, Significance of Generalization, Inheritance in Java, Access Specifiers, The Abstract Class; Packages, Defining a Package, CLASSPATH; Interface, Defining an Interface, Uses of Interfaces, Interfaces versus Abstract Classes. Exception Handling: Exception Classes; Common Exceptions; Exception Handling Techniques, Usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

UNIT-III **12Hrs.**

Multi-threaded Programming: Introduction; Creating Threads: Extending Threads; Implementing Runnable; Synchronization, Priorities, Inter-Thread Communication, Thread States and Methods on Thread Objects. Event Handling: Two Event Handling Mechanisms; The Delegation Event

Model; Event Classes; Sources of Events; Event Listener Interfaces; Using the Delegation Event Model; Adapter Classes; Inner Classes.

UNIT-IV **12Hrs.**

Lambda Expressions: Introduction, Block Lambda Expressions, Generic Functional Interfaces, Passing Lambda Expressions as Arguments, Exceptions, Variable Capture, Method References, Constructor References, Predefined Functional Interfaces. Swing: The Origins of Swing; Two Key Swing Features; Components and Containers; The Swing Packages; A Simple Swing Application; JLabel; ImageIcon; JTextField; The Swing Buttons; Understanding Layout Managers; JTabbedPane; JScrollPane; JList; JComboBox; JTable; Overview of Menu.

REFERENCE BOOKS:

1. Herbert Schildt, Java the complete reference, 7th Edition, TMH.
2. T. Budd, Understanding OOP with Java, updated edition, Pearson Education.
3. J. Nino and F.A. Hosch, An Introduction to programming and OO design using Java, John Wiley & sons.
4. Y. Daniel Liang, Introduction to Java programming, Pearson Education.
5. R.A. Johnson, An introduction to Java programming and Object Oriented Application Development, Thomson.