

1/3 MCA Second Semester

CA2T4

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Credits : 4

Lecture Hours : 4 periods / week

Internal assessment : 30 Marks

Semester and Examination: 70 Marks

Course Description:

The course provides an introduction to the concepts and methodology of Object-Oriented Programming with Java as an illustration language. Students' previous exposure to and skills in structured programming is assumed the syntax, key words and fundamental programming principles. Significant Java API libraries are also examined

Course Objectives:

- Understand major concepts of object-oriented programming.
- Experience in Java programming and program development within an integrated development environment.
- Understanding the concepts Inheritance, interfaces and packages.
- Understanding the concepts of Exception Handling, threads.
- Understanding the concepts of Event Handling
- Certain skills in Internet and windows programming and using graphical user interface by using applets and swings

UNIT I:

Object oriented thinking - Need for OOPs paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of oop concepts, coping with complexity, abstraction mechanisms.

UNIT II:

Java Basics - History of Java, Java buzzwords, datatypes, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner class, exploring string class.

UNIT III:

Inheritance – Inheritance basics, using super, Creating a multilevel hierarchy, calling constructors, method overriding, Dynamic method dispatch, using abstract classes, using final with inheritance.

UNIT IV:

Packages and Interfaces - Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Exploring packages – Java.io

UNIT V:

Exception Handling - Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.String handling, Exploring java.util

UNIT VI:

Multithreading - Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication, thread groups, daemon threads.

Enumerations, auto boxing, annotations, generics

UNIT VII:

Event Handling - Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics, layout manager – layout manager types – boarder, grid, flow, card and grid bag.

UNIT VIII:

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Swing – Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

Learning Resources

Text Books :

1. Herbert schildt , “Java; the complete reference”, TMH, 7/e, 2007.
2. T. Budd, “**Understanding OOP with Java**”, updated edition, Pearson education, 2000.

References Books:

1. J.Nino and F.A. Hosch “An Introduction to programming and OO design using Java”, John wiley & sons, 1/e, 2008.
2. T. Budd, “An Introduction to OOP”, Pearson education, 2/e, 2002.
3. Y. Daniel Liang “Introduction to Java programming” , Pearson education, 6/e, 2007.
4. Cay.S.Horstmann and Gary “Core Java 2”, Vol 1, Fundamentals, Cornell, Pearson Education, 7/e, 2001.
5. Cay.S.Horstmann and Gary Cornell “Core Java 2”, Vol 2, Advanced Features, Pearson Education, 8/e, 2008.
6. Maurach,”Beginning Java2”,JDK 5,SPD, 3/e, 2007.