

RAMAKRISHNA MISSION VIDYAMANDIRA

NEP Syllabus of B.Sc. in Computer Science

Semester-II

Course Code: 2CMSVAC1

Course Type: Value Added Course

Course Outcome:

- i) Able to solve real world problems using OOP techniques.
- ii) Able to understand the use of abstraction.
- iii) Able to understand the use of Packages and Interface in java.
- iv) Able to develop and understand exception handling, multithreaded applications with synchronization.

2CMSVAC1: Object Oriented Programming using JAVA

Credit: 2

Marks: 50

Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final class, Object class, Garbage Collection. [6 L]

Case Study of OOPS with JAVA

Introduction to Java: Compare and Contrast: C++ and JAVA, Syntax and semantic differences between C++ and Java, Compiling and Executing a Java Program, Java Architecture and Features, Variables, Constants, Keywords, Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type Checking, Built-in Java Class Methods) [3 L]

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. [4 L]

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java

Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumeration and Metadata [10 L]

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Accessing and manipulating databases using JDBC. [10 L]

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, textfields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets. [12 L]

Recommended Books:

1. Java: The Complete Reference by Herbert Schildt, 12th Edition; McGrawHill.
 2. Java How to Program by Paul Deitel, Harvey Deitel; 11th Edition; Pearson.
 3. The Java Language Specification by James Gosling, JAVA SE 8th Edition; Oracle.
 4. Object-Oriented Programming with C++ by E Balagurusamy; McGrawHill.
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