



Marwadi University

Bachelor of Computer Application Semester IV

Subject Code: 05BC0404

Subject Name: Core Java

Learning Objectives:

- To develop proficiency in creating console based applications using the Java Programming Language.
- To interpret the concepts of object oriented Programming Language and easily use Java.
- To implement multi-threaded applications using the Java Programming Language.
- To develop Applet based Application
- Introduction part to Swing Applications

Prerequisites:

- Knowledge of C and C++ Programming.

Unit	Course Content	Hours
1	Object Oriented Programming and Introduction to Java, Data types, operators, statements and defining classes in Java: <ul style="list-style-type: none">• Features of the Java Language,• Object-oriented Programming• Creating an Application in Java• Compiling and executing Applications in Java• Program comments• Primitive data types• Integer Data Types, Floating Point Data Types• Reference Data types• Arrays, single and multi-dimensional arrays• Other reference types, classes, interfaces, enums and annotations• Unicode escapes in Java source code• Understanding super types and subtypes.• Operators - Arithmetic, String concatenation, Relational, Logical, Bitwise, increment-decrement, conditional, assignment, cast and instance of operators.• Understanding the narrowing and widening conversions of numeric data types.• Statements - if, if-else, switch-case, for, while, do-while, break, continue and return statements.• Various members within a class• instance variables• methods and their overloading• constructors and their overloading• Garbage collector and finalize method• static variables and methods• Initializer blocks and the class initialize blocks	08



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2	Inheritance and sub classing in Java, packages and use of access specifiers, using common classes from the java.lang package <ul style="list-style-type: none">• Defining subclasses• Using super to use constructor of a super-class• Method overriding and use of super• Variable shadowing and use of super.• Method and variable binding• Using final with variables, methods and classes• Abstract classes and interfaces• Abstract classes and abstract methods• Single inheritance of classes• Interfaces• Object class as the super class of all classes• Methods inherited from the Object class• Uses of package and import statements• use of static imports• use of CLASSPATH for class loading• Access specifiers• Access specifiers for members of a package• Access specifiers for members of a class• Access specifiers for overriding methods• Using the Java APIs• Commonly used classes from the java.lang package• Comparable and Comparator interfaces• String, StringBuffer and the StringBuilder classes• Understanding pass by value and pass by reference for Java• Wrapper classes• o Math class constants and methods	08
3	Exceptions, Nested enum types and Collection framework <ul style="list-style-type: none">• Runtime stack and execution of application• The return and the throw statements• The return type and throws declaration in methods• Checked and the Unchecked exception classes• The Throwable class• Exception chaining• Handling exceptions with try and catch• Use of the finally block• Creating custom exception classes• Member Types• Top level nested classes and Inner classes• The local class and anonymous classes• The enum type• classes from java.util package• Date, TimeZone, Calendar and the GregorianCalendar classes• Collection Framework• Collection interface• Set and List interfaces• Map interfaces• Generics in the Collection Framework• Regular Expressions, Pattern and Matcher classes• Scanner class• Varargs and the Formatter class	10



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4	Stream based I/O and Multi-threading: <ul style="list-style-type: none">• Stream classes• OutputStream and the Writer classes• InputStream and the Reader classes• Bridge classes OutputStreamWriter and the InputStreamReader• Writing and reading from files using FileOutputStream and the FileInputStream• Piped Streams• Array based streams• Filter streams• Buffered streams• PrintStream and the PrintWriter classes• Data and Object streams• RandomAccessFile• Multi-threading• Thread class and thread of execution• Creating a new Thread of execution• ThreadGroup• properties of Thread instance• Daemon Threads• Thread states• Synchronization• Another way of creating a thread of execution	10
5	GUI Programming, Building Applets and Swing Applications <ul style="list-style-type: none">• Comparing AWT and swing features• AWT Components• Overview of the AWT components• Component properties• Graphics context• Containers• Container class• Layout Managers• Top-level containers• Window class• Decorated windows Frame and Dialog• Panel class• Events• Event Delegation Model• AWTEvents• Adapter classes• Swing and MVC• JComponent• JOptionPane• Showing Message, Confirm and Input Dialogs• Browser as a container for Applets• Life-cycle of an Applet• AppletStub and <applet> tag• AppletContext and the URL class.• Applet class	12



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Text Book(s):	
1. Java: The Complete Reference, Seventh Edition by Herbert Schildt	
2. Cay S Horstmann, Gary Cornell, "Core Java 2, Volume 1 - Fundamentals", Pearson Education (9 th edition - 2013).	
Reference Book(s):	
1. Ivor Horton's "Beginning Java 2" JDK 5 Edition, Wiley Computer Publishing, (2007).	
2. Ken Arnold, James Gosling, David Holmes, "The Java Programming Language", Addison-Wesley Pearson Education (4th Edition - 2005).	
3. Raj Kumar Buyya, S. Thamarai Selvi, & Xing Chen Chu, "Object-Oriented Programming with Java: Essentials & Applications", Tata McGraw Hill	
4. Cay Horstmann, "Big Java", Wiley Computer publishing (2nd edition - 2006).	
5. Hari Mohan Pandey, "Java Programming", Pearson	
6. Sharan Zakhour, Scott Hommel, Jacob Royal, Isaac Rabinovitch, Tom Risser, Mark Hoerber "The Java Tutorial", Addison-Wesley Pearson Education(4th Edition)	
7. Pravin Jain, "The Class of Java", Pearson Education.	
Chapter wise coverage from the Text Books:	
Unit No.	Topics/Subtopics
1	Chapter 1 to 6
2	Chapter 7 to 9 and 15
3	Chapter 10,17,18
4	Chapter 11,13, 19
5	Chapter 21 to 25 and Chapter 7,9 from Text book No. 2