Syllabus for BCA Sem - 3

- **Sem.** : BCA - 3
- **Subject Code** : 05BC1304
- **Subject** : Programming using Java
- **Course Objectives** :

1. To develop proficiency in creating console based applications using the Java Programming Language.
2. To interpret the concepts of object oriented Programming Language and easily use Java.
3. To implement multi-threaded applications using the Java Programming Language.
4. To understand and implement File Handling in Java.
5. To develop Application using Database Connectivity in Java.

- **Prerequisites** : Knowledge of C and C++ Programming.

Unit No	Topics Covered	No of lectures required
1	**Object Oriented Programming and Introduction to Java, Data types, operators, statements and defining classes in Java:** 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 sub types 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 construct or sand their overloading Garbage collector and finalize method Static variables and methods Initializer blocks & Class Initializer blocks	10

Syllabus for BCA Sem - 3

2	**Inheritance and sub classing in Java, packages and use of access specifiers, using common classes from the java.lang package** Defining subclasses Using super to use construct or 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 staticim ports 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, String Buffer and the String Builder classes Understanding pass by value and pass by reference for Java Wrapper classes Math class constants and methods	10
3	**Exceptions, Nestedenum types and Collection framework** Runtime stack and execution of application The return and the throw statements There turntype and throws declarationin methods Checked and the Unchecked exception classes The Throwable class Exception chaining Handling exceptions with try and catch Use of the finally block Member Types Top level nested classes and Inner classes The local class and anonymous classes The enum type Classes from java.util package Date, Time Zone, Calendar and the Gregorian Calendar classes Collection Framework Collection interface Set and List interfaces Map interfaces Generics in the Collection Framework Regular Expressions, Pattern and Matcher classes Varargs and the Formatter class Scanner class	10
4	**Stream based I/O and Multi-threading:** Stream classes Output Stream and the Writer classes Input Stream and the Reader classes Bridge classes Output Stream Writer and the Input Stream Reader Writing and reading from files using File Output Stream and the File Input Stream	12

	Piped Streams Array based streams Filter streams Buffered streams Print Stream and the Print Writer classes Data and Object streams Random Access File Multi-threading Thread class and thread of execution Creating a new Thread of execution Thread Group Properties of Thread instance Daemon Threads Thread states Synchronization Another way of creating a thread of execution	
5	**Database Connectivity** The Design of JDBC, JDBC Driver Types, SQL, JDBC Configuration: URL, driver jar files, starting the database, registering the driver class, connecting to database, Working with JDBC Statements: executing SQL statement, managing connections, statements, Result sets, SQL exceptions, Query Execution: prepared statement.	**8**

- **Course Outcomes:**
  1. Describe the basic concepts of OOP with Java
  2. Construct console based applications using various features of java.
  3. Determine how to use Exception handling in Java
  4. Determine how to use Multithreading in Java
  5. Construct Applications based on Database Connectivity.

- **Course Outcomes – Program Outcomes Mapping Table :**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	H	H	M		H			L	H		H
CO2					H			H		L	
CO3					H			H			M
CO4	H					L	M				H
CO5			H	H		H			M		

- **Text Book :**
  1. Java: The Complete Reference, Seventh Edition by Herbert Schildt
  2. Cay S Horstmann, Gary Cornell, "Core Java 2, Volume 1 – Fundamentals", Pearson Education(9th edition – 2013).

Syllabus for BCA Sem - 3

- **Reference Books :**

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. ThamaraiSelvi, & Xing Chen Chu, "Object-Oriented Programming with
4. Java: Essentials & Applications", Tata McGraw Hill
5. Cay Horstmann, "Big Java", Wiley Computer publishing (2nd edition – 2006).
6. Hari Mohan Pandey, "Java Programming", Pearson
7. SharanZakhour, Scott Hommel, Jacob Royal, Isaac Rabinovitch, Tom Risser, Mark Hoeber
8. "The Java Tutorial", Addison-Wesley Pearson Education(4th Edition)
9. Pravin Jain, "The Class of Java", Pearson Education.

- **Web References:**

1. www.javatpoint.com
2. www.java2s.com
3. www.roseindia.net

- **App References:**

1. Learn Java Programming
2. 1000 Java Programming

- **Syllabus Coverage from text /reference book & web/app reference:**

Unit No	Chapter Numbers
1	Chapter1 to 6
2	Chapter7 to 9 and15
3	Chapter10,17,18
4	Chapter11,13, 19
5	Chapter21 to25 andChapter7,9 fromText book No.2

Syllabus for BCA Sem - 3

PRACTICALS

Unit No	List of Practicals
1	1. Write a simple java program to display message. 2. Write a java program to get a name from user and display on screen. 3. Write a java program to get personal information from user and display on screen. 4. Write a java program to perform different arithmetic operations. (Using Command Line args) 5. Write a java program to get different values from user at runtime using Scanner. 6. Write a java program to get the name from user and print 10 times using loop. 7. Write a java program to use IF Condition 8. Write a java program to find ODD or EVEN number using command line argument 9. Write a java program to find out students result/grade using IF condition. 10. Write a java program of 1D array
2	11. Write a java program to use Interface in java 12. Write a java program to extend one interface into another interface 13. Write a java program to perform simple inheritance. 14. Write a java program to use multilevel inheritance. 15. Write a java program to use Hierarchical inheritance 16. Write a java program to use Abstract class 17. Write a java program to use interface 18. Write a java program to use Multiple inheritance using interface. 19. Write a java program to use method overriding 20. Write a java program to perform overriding of abstract class 21. Write a java program to demonstrate encapsulation
3	22 Write a java program to implement simple exception handling 23 Write a java program to implement Arithmetic Exception 24 Write a java program to use Finally block in Exception Handling 25 Write a java program to use Multiple Catch Block 26 Write a java program to use Throw Keyword 27 Write a java program to use Throws Keyword 28 Write a java program to implement custom exception 29 Write a java program to implement Exception Propagation 30 Write a java program to implement Exception Chaining 31 Write a java program to use simple inner class in your program 32 Write a java program to use Static Inner Class 33 Write a java program to use Local Inner Class 34 Write a java program to use Nested Interface 35 Write a java program to display date in different format 36 Write a java program to display different calendar information using calendar class 37 Write a java program to add, subtract a days/month into current date and time 38 Write a java program to use Gregorian calendar to display calendar information
4	39. Write a java program to store multiple elements using an ArrayList 40. Write a java program to add multiple elements into LinkedList 41. Write a java program to store multiple values in a Vector and fetch it using an

	Enumeration 42. Write a java program to store multiple values in a Queue and perform different operation on it. 43. Write a java program to add Book IDs and Book Names (Pairs) using a HashSet. 44. Write a java program to demonstrate PriorityQueue 45. Write a java program to store different mapped values (Key-Value) using aTreeMap Class 46. Write a java program to add multiple elements using a SortedSet of collection 47. Write a java program to add multiple elements and perform operation based on LIFO method using a Stack Class of collection interface. 48. Write a java program to add different values in a pair (key-value) into a TreeMap and perform different operations on it. 49. Write a java program to write a simple message into a file using a FileOutputStream 50. Write a java program to read a message (data) from a file by using FileInputStream. 51. Write a java program to write a data into a file characterise by using a FileWriter class of IO 52. Write a java program to read a data characterwise from a file by using a FileReader class. 53. Write a java program to create a thread using Thread Class 54. Write a java program to create a thread using Runnable class 55. Write a java program to set Thread name and priority & test it. 56. Write a java program to create two threads and make them Synchronized (Thread Safe) 57. Write a java program to join two threads which perform loop operations.
5	58. Write a JDBC program to Insert data into Oracle Table 59. Write a JDBC program to Display data into Oracle Table 60. Write a JDBC program to Update data into Oracle Table 61. Write a JDBC program to Delete data into Oracle Table 62. Write a JDBC program to Insert Records Into Oracle Table Using Prepared Statement. 63. Write a JDBC program to Display Records Into Oracle Table Using Prepared Statement. 64. Write a JDBC program to demonstrate use of Callable statement.